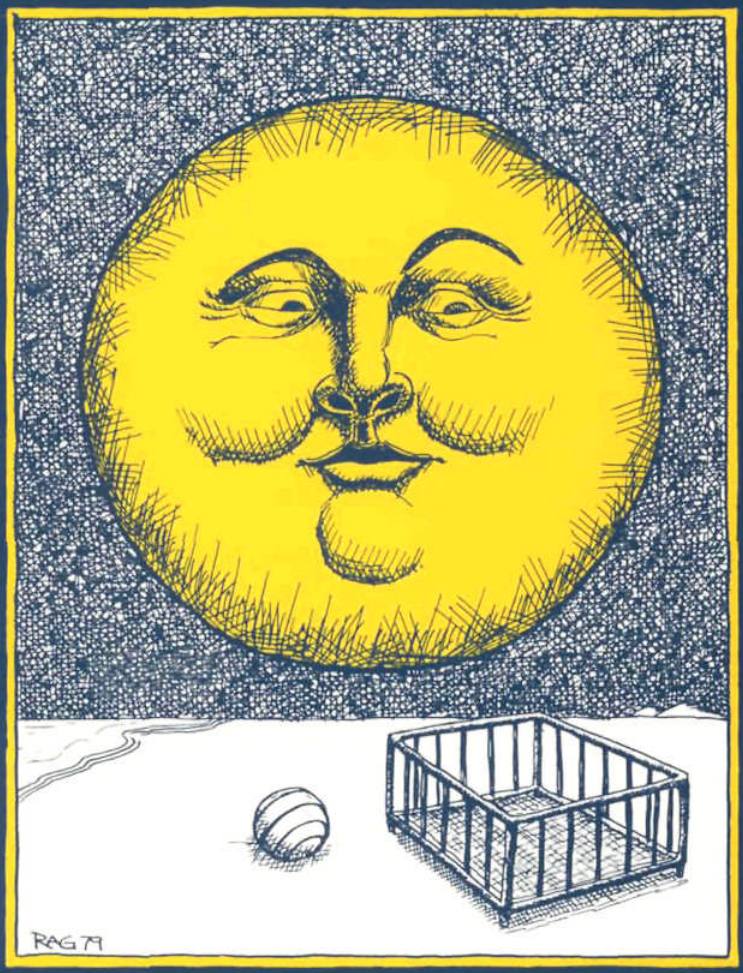
the Skeptical Inquirer

THE ZETETIC



The Moon and the Maternity Ward

Good-bye to Biorhythms / Foiling a "Cold Reading" / Students and the Paranormal / High Sorcery in Colombia

Published by the Committee for the Scientific Investigation of Claims of the Paranormal
VOL. III NO. 4 SUMMER 1979

Editorial Board Martin Gardner
Ray Hyman
Philip J. Klass
Paul Kurtz
James Randi
Dennis Rawlins

Editor Kendrick Frazier

Assistant Editor Doris Hawley Doyle

Consulting Editors James E. Alcock
Isaac Asimov
William Sims Bainbridge
John Boardman
Milbourne Christopher
John R. Cole
Richard de Mille
Eric J. Dingwall
Christopher Evans
C. E. M. Hansel
Robert Sheaffer

Production Editor Betsy Offermann

Circulation Director Lynette Nisbet

Staff Mary Rose Hays
Kitty Turner
Kolawole Azibola

THE SKEPTICAL INQUIRER (formerly THE ZETETIC) is the official journal of the Committee for the Scientific Investigation of Claims of the Paranormal (CSICOP, Inc.)

Manuscripts, letters, books for review, and editorial inquiries should be addressed to The Editor, THE SKEPTICAL INQUIRER, 3025 Palo Alto Dr., N.E., Albuquerque, New Mexico 87111.

Subscriptions, changes of address, and advertising should be addressed to: Executive Office, THE SKEPTICAL INQUIRER, 1203 Kensington Ave., Buffalo, New York 14215. Old address as well as new are necessary for change of subscriber's address, with six weeks advance notice.

Inquiries from the media about the work of the Committee for the Scientific Investigation of Claims of the Paranormal should be made to the Executive Office. Tel.: (716) 834-3223.

Copyright © 1979 by The Committee for the Scientific Investigation of Claims of the Paranormal, 1203 Kensington Ave., Buffalo, New York 14215. Application for permission to quote from this journal should be addressed to the Executive Office.

Subscription rates: Individuals, $15; libraries and institutions, $15; sustaining subscribers, $100 or more; back issues $5.00 each (vol. 1, no. 1, through vol. 2, no. 2, $7.50 each)

Postmaster: THE SKEPTICAL INQUIRER is published quarterly—Spring, Summer, Fall, and Winter—and printed at Artcraft-Burow, Buffalo, New York. Application to mail at second-class postage rates is pending at Buffalo, New York.

the Skeptical Inquirer

THE ZETETIC

Journal of the Committee for the Scientific Investigation of Claims of the Paranormal
Volume III, No. 4 ISSN 0194-6730 Summer 1979

2 NEWS AND COMMENT
Schmidt's experiments/Stone's plummet/Psychics and crime/ Netherlands UFO/Parliament's encounter/Psychic moon probes/ School reader/Selective exposure

14 PSYCHIC VIBRATIONS

ARTICLES

17 The Moon and the Maternity Ward, *by George O. Abell and Bennett Greenspan*
26 Biorhythm Theory: A Critical Review, *by Terence M. Hines*
37 "Cold Reading" Revisited, *by James Randi*
42 The Teacher, the Student, and the Reports of the Paranormal, *by Elmer Kral*
47 An Encounter with the World's Greatest Sorcerer, *by John Sack*

BOOK REVIEWS

51 Leslie Shepard, ed., *Encyclopedia of Occultism & Parapsychology* (Ray Hyman)
58 *Proceedings of the 1976 CUFOS Conference* (Robert Sheaffer)
61 Lloyd R. Bailey, *Where Is Noah's Ark?* (Robert A. Moore)
63 Jan Ludwig, ed., *Philosophy and Parapsychology* (Mario Bunge)

66 BASIC ANNOTATED BIBLIOGRAPHY

72 FROM OUR READERS
Letters from Warner Clements, Mortimer T. Cohen, R. P. Oliver, Peter Schenkel, L. Sprague de Camp, Stephen Barrett, Douglas E. Brintnall, Walter E. Runkel, John A. Speyrer, George Fergus, Ronald Story, J. Barnard Gilmore, Ralph W. Bastedo

On the cover: Illustration by Richard A. Goldberg

News & Comment

Schmidt's airing at the APS

Parapsychology came to the American Physical Society earlier this year in the form of a symposium on the random-number generator experiments of Helmut Schmidt. Out of it came considerable new interest in Schmidt's work, which has seemingly produced slightly higher than chance results over thousands of trials with some subjects and some strongly urged cautions to temper enthusiasms with historical perspective on the pitfalls of previous attempts by physicists to demonstrate extrasensory perception.

For about a decade, Schmidt, a physicist at the Mind Science Foundation in San Antonio, has been using random-number generators of his own devising to test for the possible ability of psychokinesis. The equipment makes use of the decay of radioactive atoms, a process in which the times at which individual decays occur are entirely random. A Geiger counter recording a decay is linked with a fast oscillating switch that stops in either the up or down position by a signal from the counter. This results in, essentially, an electronic "coin flipper." Schmidt employs the impulses from the switch to drive a visual display, usually a panel of lights. In one arrangement, the subject sees a display of red and green lights. Which particular light is on at each moment is determined by the random generator. Each should be on 50 percent of the time.

In a typical experiment a subject sits in front of the generator and attempts mentally to bias, say, the red light to come on more frequently. Both external and sealed-in internal counters keep track of the number of flashes of each color that take place.

Schmidt finds that successful subjects sometimes succeed in apparently biasing the output of the random-number generator to a highly significant degree. A typical result might be 50.8 percent occurrences of the target light when chance would be 50.0 percent. The best subject achieved a hit rate of 52.5 percent during the course of 6,400 trials conducted over many short intervals. Although the magnitude of the effect, when obtained, is very small, the probability of its being just a chance deviation is said to be astronomically small because of the huge numbers of trials involved.

The APS symposium came about because Paul Horwitz, a physicist and the incoming president of APS's Forum on Physics and Society, decided it was time for the Society to deal with the questions raised by parapsychology—and particularly those involving Schmidt, himself a physicist who uses devices that physicists can relate to.

Along with Schmidt, Horwitz

asked Ray Hyman, professor of psychology at the University of Oregon, to help analyze and critique Schmidt's work. Hyman is known as a knowledgeable and fair-minded critic of parapsychological research, including that conducted by physicists. Hyman had access to all of Schmidt's papers (although not his raw data) before the symposium, and they had corresponded about their views.

Hyman and magician/investigator James Randi dined with Schmidt before and after the New York symposium. "Both Randi and I were convinced that he was sincere, honest, and dedicated to being as scientific as possible about the whole business," says Hyman. "I also felt that in many ways Schmidt was the most sophisticated parapsychologist that I have encountered. If there are flaws in his work, they are not the more common or obvious ones. They must involve subtleties or hidden biases that cannot be detected from a review of his published data or from carefully interviewing him. Probably someone like myself would have to be on location with him, under conditions wherein he was getting positive results, to get a good idea of what is going awry to produce these effects—if, indeed, anything is going awry."

Martin Gardner, who has followed Schmidt's work, echoes the latter point: "It is impossible to evaluate Schmidt's work because he works virtually alone, and no one so far has had any access to his raw data."

Despite his admiration for Schmidt's methods, Hyman warns very strongly against jumping to any conclusions about its significance. "It is still too early to evaluate Schmidt's work," he says. "It takes about 25 years, by my calculations, before we realize the weaknesses and problems of a new and promising paradigm in parapsychology and for a typical 'ironclad' ESP experiment to drop completely out of contention. Schmidt and his paradigm have been on the scene for only 10 years."

Hyman's 28-page paper for the assembled physicists enumerated the many perils and pitfalls physicists have faced when they involved themselves in psychical research, from Faraday's investigations of table-turning to Targ and Puthoff's studies of the now-discredited Uri Geller. He especially took note of Robert Hare, Sir William Crookes, and Professor J. C. F. Zoellner as outstanding physical scientists who had endorsed alleged psychics who later turned out to be fraudulent. It's not that their erroneous support of psychic phenomena detracted from their ability to carry out normal science successfully, Hyman says, "it is just that training and aptitude for doing normal science does not at all prepare one for dealing with confidence men who are willing to exploit the scientist's rational and systematic approach to nature." Hyman urged distinguishing between such "ad hoc testing" of claims by alleged psychics, which "is not science," and parapsychological research employing standardized tasks and paradigms (such as Schmidt's experiments). Claims coming out of the latter, he says, should be treated more seriously. "However, such claims have yet to achieve the sort of status that requires serious scientific attention at this time."

The important historical point, Hyman stresses, is that, with the obvious exception of the most current examples, "the earlier exemplars have faded into oblivion. Some, such as the Creery sisters, Smith-Blackburn, and the Soal-Goldney experiments [see our Winter 1978 issue, p. 23], were subsequently shown to have involved fraud or other irregularities. Others turned out to be no longer reproducible." He lists "quite compelling" reasons for "hesitating to endorse the claims of parapsychology": serious defects in given experiments, the shifting basis on which claims are

made, dropoffs in positive results after early phases of trials, declines in results as controls are made stronger, and the frequent need to resort to "displacement effects" to claim positive results.

"By almost any standard Schmidt's work is the most challenging ever to confront critics such as myself," says Hyman. "His approach makes many of the earlier criticisms of parapsychological research obsolete. The targets are randomized automatically. The data are recorded in such a way as to avoid obvious possibilities for recording errors and biases. The total number of trials per experiment are set in advance. Schmidt monitors the randomness of the generator before, during, and after each experimental run. And he always predicts the sort of result (psi missing or psi hitting) in advance on the basis of a preliminary experiment for each major experiment."

Nevertheless, Hyman says that Schmidt's paradigm "is beginning to exhibit the sort of symptoms that have plagued previous candidates for the convincing experiment." Some investigators claim to have replicated his findings. Others, such as John Beloff, have been completely unsuccessful in replication attempts. Also, says Hyman, some of the claimed "confirmations" are really not what he would consider strict replications.

Furthermore, the research technique is new and relatively unfamiliar. "Pioneering research such as Schmidt's may contain many unsuspected and novel types of problems that will take a while to fully thresh out. New and unsophisticated technology can hold much promise; but it inevitably takes time to debug and fully understand the quirks of any new instrumentation."

The most serious problem with Schmidt's, as well as other parapsychology claims, says Hyman, is the "privileged observer" effect. Schmidt claims that only certain types of experiments can achieve results: The experimenters must believe in the effect; they must be enthusiastic; and they must convey this enthusiasm to their subjects.

"My guess," says Hyman, "is that as long as only certain experimenters can achieve positive results, and as long as the direction of the outcome can be predicted only locally and only for a given experiment, orthodox science has no way of dealing with such claims.

"Something important is probably taking place." concludes Hyman, speaking now of all current claims of parapsychology. "Probably, in my opinion, whatever it turns out to be will differ greatly from what either the believers or the critics think is going on. I suspect that answers will have more of an impact on the philosophy of science, methodology, and the sociology of science than on the fundamental forces and laws as envisioned by contemporary physics. Even if it all turns out to be massive fraud or self-delusion, it is important to study because this would have important implications for what could take place in other areas of scientific inquiry."

—*Kendrick Frazier*

Stone's plummet in Baltimore

To a sports-minded nation, a claimed mental ability to predict not only the outcome of the games but also the occurrence of specific plays in national championship athletic contests has more than enough appeal and drama to gladden a TV director's heart. Combine it all with a national news service article, the hype of a local TV station, and the prestige of its local evening newscast, and you have the ingredients for the kind of fiasco Baltimore viewers were treated to at Super Bowl time this past January. Fortunately, the "mentalist" was unveiled as a trickster, but not before the TV station, ignoring warnings that it was deceiving the public,

had milked the event for all the publicity and viewing audience it could get.

It all began the previous fall. Mark Stone, a Baltimore stockbroker and part-time "mentalist" who had previously appeared on the "Tonight Show," persuaded station WJZ-TV, Channel 13, an ABC affiliate in Baltimore, to let him predict the outcome of the upcoming World Series. On October 6, two days before the Series' opening game, Stone wrote his predictions (unseen by anyone else) on a piece of paper. Then they were carefully sealed, locked in a metal box, and given to the station's sportscaster, Klaus Wagner, to hold. The predictions were opened during the station's evening newscast on October 18, at the conclusion of the Series.

To everyone's amazement, Stone had correctly predicted the outcome of each game (the Dodgers' winning the first two games, the Yankees' winning the final four). But even more impressive were his predictions of dramatic plays. He had foretold Davey Lopes's two home runs in the opening game, Reggie Jackson's game-ending strikeout in game two, Craig Nettles's "incredible fielding display" in game three, and many other specific details. The Associated Press distributed a news dispatch about the success ("World Series Results Foreseen by Stone," the *Baltimore Sun* headlined it), and an excited Wagner was quoted in one of those statements that live forever: "I couldn't believe it, honestly. He couldn't have gotten to it beforehand. No way he could have faked it—no way."

In January, Stone was back again to predict the AFC and NFC football playoffs and the Super Bowl. On January 5, two days before the playoffs, Stone delivered a sealed metal box containing his predictions to the station during its evening sportscast. On January 22, with all the games completed and with fanfare hailing the event, security guards brought the box into the studio during the station's 6 o'clock evening news, and the drama began.

Sportscaster Wagner unlocked the box with a key given him by Stone (sitting nearby). Inside he found a well-taped cardboard box, which he tore open. Inside this was another metal box, locked, which he was not able to open with a second key supplied to him by Stone. The news anchorman also tried to unlock the box with the key but failed. Stone then prevailed upon them to let him try; and while they were talking about something else to kill time, Stone got the box open, exposing a tiny box, which he extracted and handed to Wagner.

Once again the sealed predictions were astonishingly accurate. The outcome of all games were predicted correctly, particular plays were accurately described, and the exact score of the Super Bowl game (Steelers over the Cowboys, 35 to 31) was given.

But that wasn't the big surprise. Shortly after completion of the 6 P.M. newscast, Wagner, upon closely examining the innermost box, discovered a covert slot. In fact, one whole side slid out. He confronted Stone with the evidence, with the cameras still taping. An embarrassed Stone said he had never claimed to be a psychic, only an entertainer. This entire sequence was then shown on the station's 11 P.M. news, preceded by an announcement by station news director Scott Goodfellow that the predictions had been a "trick." It was clear that Stone had used the jammed-lock ruse to give him the opportunity and the time to insert his post-game "predictions" into the box.

The television station tried to put up a brave front about its role in these events; but the Baltimore newspapers, to their credit, weren't in the mood for any more nonsense.

"Why the Gong Show News at

Channel 13?" asked *Sun* columnist Bill Carter. "When you stoop to putting on charlatans with impossible sports predictions—and thus give them the credence of being associated with a 'news' broadcast—you pass the level of comedy and sink to the level of dangerous ridiculousness. . . . Channel 13's store of skepticism is apparently as low as its store of news judgment."

The headline on television writer Steven Reddicliffe's column in the *Baltimore News American* was: "Step right up, folks, for the television circus at Channel 13." Reddicliffe noted the "incredible amount of air time" the "charade" took up and said it "raised a lot of questions even before it became a heavy embarrassment." He concluded: "Surely the time taken up by Stone's appearance could have been used for something else—real news, for instance. Mark Stone may have tried to fool everyone, but he didn't come out looking like a fool himself. That distinction was reserved for the news staff at Channel 13, the people who invited a magician to their news show and then wore long faces when their gullibility was exposed."

Reddicliffe also rejected the station management's claim that their news personnel "were not" part of a publicity stunt. "Wrong. First the station made the decision to devote a great deal of its news broadcast to a magician's appearance. Then, they used even more time discussing how they had been tricked."

Reddicliffe didn't know how right he was. For despite the station's public proclamations of innocence, it had been warned that Stone might be a fake but had neglected the warnings.

On October 22, 1978, long before the Super Bowl "predictions," Gary P. Posner, a Baltimore physician and investigator of paranormal claims, wrote to WJZ-TV station manager William Baker expressing concern about the station's promoting "unsubstantiated claims of a local magician." He reported that during Stone's earlier appearance on the "Tonight Show," Stone's "psychic" score in guessing cards suddenly deteriorated from 100 percent accurate to 100 percent inaccurate when Johnny Carson, suspicious of a trick, had Stone move across the stage where he could not see the cards shuffled. Posner followed with another letter on December 2, this time enclosing a letter from magician James Randi giving details of Stone's methods of trickery and giving further background about Stone's exposure on the "Tonight Show," based on Randi's conversations with Carson. "Mark Stone is only another of the long list of magicians who feel they can 'con' public officials, scientists and the media into a belief in their powers," Randi wrote. Randi followed with letters to both Goodfellow and Baker on January 3 suggesting a system of controlling the tricks of Stone. It was detailed and specific.

None of the advice from Posner and Randi was followed. There is little doubt that the leading culprit in this affair was not Stone, who, like countless others before him, was merely exploiting the gullibility of others for publicity. Rather it was WJZ-TV, who knew full well the probability that deception was involved but nevertheless proceeded.

Summarized Posner: "By rejecting out of hand Randi's suggested protocol, WJZ deliberately chose not to properly control the conditions of Stone's performance, despite having been warned well in advance of Stone's penchant for such fakery. It would seem that the 'Stone affair' was intended all along to be *not* a test of 'psychic' ability but simply a banal exercise in mutual exploitation—Stone, able to use his own gadgetry, could not 'miss' and was assured (he thought) of national stardom; WJZ was assured of the high

ratings it so desperately strives for."

So once more the case has been closed on a new incident of a psychic claimant and a communications organ collaborating for mutual benefit and public exploitation. Experience, regrettably, shows it won't be the last.

—*K. F.*

Psychics and crime

With women on both coasts making headlines this year by supposedly helping police solve crimes and find missing bodies, it's useful to note the results of a study by the Los Angeles Police Department of the use of psychics in crime investigations.

The study was prompted by anecdotal reports of major crimes being solved by using information from "sensitives." As the researchers say, attempts to verify these reports with the police agencies mentioned have been unsuccessful. The Los Angeles Police Department (LAPD) psychology staff had previously worked with two alleged psychics on two unrelated homicide cases. Information they offered proved to be of no value in concretely assisting case investigators.

The new study was conducted by Martin Resier, Susan Saxe, and Clare Wagner, of the LAPD's behavioral science services section in collaboration with psychologist Louise Ludwig, of Los Angeles City College. It was published in the March 1979 *Journal of Police Science and Administration.*

Eight professional and four amateur "psychics" were given information about four actual crimes, two solved and two unsolved. First they were given a sealed envelope containing physical evidence and asked to elucidate its contents. Then they were allowed to examine the evidence and give their reactions. Many of the psychics thought the crimes were related to the Hillside Strangler case, then much in the news, but none of the four crimes was related to that case.

The results of the tests were negative. "Overall, little, if any, information was elicited from the twelve psychic participants that would provide material helpful in the investigation of the major crimes in question," the authors conclude. "There was a low rate of inter-psychic congruence and accuracy among the responses elicited in this research. We are forced to conclude, based on our results, that the usefulness of psychics as an aid in criminal investigation has not been validated."

—*K.F.*

Netherlands UFO flurry

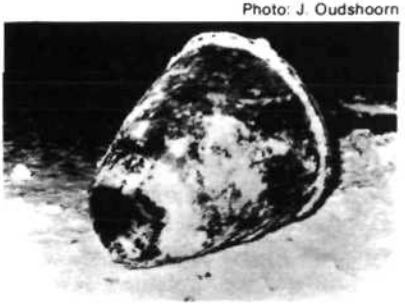
On December 31, 1978, there was an impressive flurry of UFO sightings in the Netherlands. Several thousand people reportedly saw a formation of UFOs pass across the northern sky. Most eyewitnesses in the northern part of the country saw the formation pass at a relatively high elevation, while observers in the southern part saw the lights low over the northern horizon. The phenomenon was generally described as a series of very bright lights with twinkling tails. They appeared to come from the northwest and to disappear in the northeast. The duration of the massive sighting was well over two minutes. Due to some extremely attentive and exact observations by a pilot and a number of amateur astronomers taking advantage of the clear weather, the precise time of the event could be established: 8:03 P.M. to 8:06 P.M. local time. Most observers, however, assumed the time to have been "around 8 o'clock" or "between 7:30 and 8."

On January 2, 1979, most newspapers carried articles about the observations. Some articles referred to the UFO flurry at that very time in other countries, thus suggesting that the New Year's Eve sightings were part of a

worldwide UFO wave.

Some experts, although well within their discipline, were too hasty in trying to explain the many UFO reports. Professor C. de Jager of the State University of Utrecht, said, according to the Dutch press: "The observations were possibly caused by a bright fireball that entered the atmosphere." An expert from the Royal Dutch Meteorological Institute at De Bilt, whose name was withheld by the press, said: "The observations were possibly caused by a rare aurora phenomenon."

Photo: J. Oudshoorn



Debris of recent Dutch "UFO," part of a Soviet rocket booster.

In the meantime, the well-known Dutch satellite observer, Mr. Bert Kroon, from Apeldoorn, who works at the Dutch satellite-tracking station Kootwijk, started calculations based upon the UFO reports and compared these with satellite estimates of that evening. It turned out that the booster of a Russian rocket, 1978-123B, launched on December 25, 1978, had been the cause of the UFO flurry. The booster apparently decayed at about 8:03 P.M. M.E.T. between Aberdeen, Scotland, and Hannover, West Germany. According to Kroon, the booster broke up into 10 or 12 pieces, of which probably the brightest parts were reported by most observers.

On January 4, 1979, Professor de Jager told *Trouw*, a Dutch newspaper: "I agree that the observations were due to the decay of a Russian rocket."

At about the same time, I had become aware of newspaper accounts in the German regional press that many people near Hannover were searching for "unbekannten Teilen aus dem All"—unknown fragments from outer space!

It appeared that several people near Stolzenau, a small town about 12 miles west of Hannover, had heard three strange whooshing sounds on New Year's Eve. "The sound was like a projectile passing by," a German witness claimed. Thanks to the help of the Dutch military forces in Germany, pictures were made available of a conical debris of the decayed Russian rocket that had been found. The pictures were made by Mr. J. Oudshoorn, a medic, by order of Dutch military intelligence.

The pictures provide us with conclusive evidence on the nature of the UFO flurry of December 31, 1978, in the Netherlands. So far, no eyewitness has rejected this well-documented evidence as explanation for his or her UFO report.

In strong contrast is the UFO report of a family who, on the same evening at about 11 P.M., reportedly saw a bright UFO in the sky. This family of four were living in the village of Poortugaal, almost a suburb of Rotterdam. The population density in that area exceeds 300 persons per square mile. Nevertheless, only this family saw, coming from the south and "following the usual airplane route," a bright light and some red and green lights. "What I saw were several lights," reported Mrs. Monika Krouwel, "red and green blinking lights. I could not see the object itself but got the impression that it was egg-shaped." According to Mr. Jan Krouwel, the UFO was "something with lights. The lights were blinking. Two red and one or two green lights, I don't recall, and a bright white light!" Because the configuration of lights

apparently had been visible for several minutes in a fairly fixed position in the bright night sky, in his opinion it could not have been a regular airliner.

Bertus Kroon and I examined this report. The bureau of administration of landing fees at Schiphol Airport in Amsterdam, revealed that four airliners had landed within the period of the UFO sighting: At 11:05 P.M. the Spanish Iberia flight 666 from Madrid passed the Rotterdam area. At 11 P.M. the Dutch KL-906 from London passed west of the area, probably too far west to be seen. At 11:12 P.M. the Dutch Martinair MP 252 from Las Palmas, a DC-10, passed over the exact area concerned. Finally, at 11:28 P.M. the Air-India AI-002 from Moscow entered the Dutch airspace from the east, but remained invisible at all times to the Poortugaal observers.

The significant point is that the UFO report explicitly mentions the absence of airplanes at a moment when at least *one* must have been visible. In our opinion, the slowly descending Martinair DC-10 was the cause of the UFO report. A descent directly in line with the line of sight of the observer would cause the airplane's lights to appear fixed and explain the sighting. The Krouwel family was confronted with our evidence and within a few days wrote back: "We know what we have seen, and it absolutely was no airliner, helicopter, or star. You can't talk this out of our heads. We now know one thing for certain—that when we see something unusual again you will be the last we report it to!"

We are not discouraged by this blunt reaction. It is symptomatic of the human behavior concerning UFO phenomena.

—*Hans van Kampen*

Hans van Kampen is a noted science editor and UFO investigator in the Netherlands.

Parliament's encounter with UFOs

On the evening of January 17, 1979, no less a body than the House of Lords of the British Parliament took up one of the great issues of our time: UFOs. Following on the light beams of the New Zealand UFO flap of early January, the House of Lords showed that it is no more immune to befuddlement, bewilderment, and confusion than its elected counterparts in other nations.

To be fair, many of the able Lords tried their best to bring calm and reason, and even some facts, into the debate: "Over the United Kingdom, Jodrell Bank's radio telescope, the first and still one of the most powerful in the world, has observed thousands of possible subjects for identification as UFOs, but not a single one has proved other than natural phenomena." "Why, indeed, we are told even the great President Carter has spotted one [a UFO], but it is a pity we did not read the rest of the subsequent report. It was later discovered that that was Venus, precisely in those conditions I have described." And the British style puts our own legislators to shame: "I am sorry, the existence of UFOs is even more fanciful than Gilbert and Sullivan's *Iolanthe*—charming indeed, but I am afraid a joke upon your Lordship's House."

But such sober reflections were nearly lost in the glare of such statements as: "These machines do exist in one form or another, abstract or solid, and they do travel at stunning speeds which seem to defy proved natural physics." "I suspect that the British Government do have a Department studying UFO sightings, for why else should they bother to go to such trouble to publicly debunk reported ones if they are of no interest to them?" "It is thought that these craft can produce a near vacuum envelope around them-

selves which in turn would allow them virtually unlimited speed ... Not being a scientist I cannot enlarge upon this explanation." "My Lords, this world-wide UFO invasion of every country's air space is of growing importance and therefore I suggest that Parliament keeps a continuous watch on the situation."

What's interesting in all this is not the debate itself, whose 70 pages make lively enough reading in the next day's official report of the House of Lords debates (the *Hansard*), but the name of the debate's instigator, prime mover, lead-off speaker: the Earl of Clancarty. And who is Lord Clancarty? Under the name of Brinsely Le Poer Trench, he is one of Britain's leading authors of pseudoscientific, UFO, and pro-occult books. His latest work, *Secret of the Ages*, seriously espouses the notion that there is a hole in the North Pole through which all manner of machines and things make their passage outward from the earth's interior to do whatever they do.

It's almost consoling to realize that the British too have to put up with such people's exotic and factually unconstrained proposals. At least Charles Berlitz is not a member of Congress.

—*K.F.*

Psychic moon probes

The Japanese space program is continuing to gain momentum, and some experts are predicting that Japan will launch scientific moon probes within a few years. But according to the *National Enquirer*, a Japanese spaceman has already been out to the moon—in spirit, if not in body.

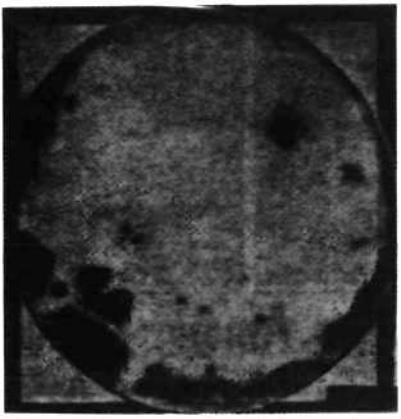
"Psychic Revealed Moon's Dark Side Before Anyone Ever Saw It," shouted the headline in the September 19, 1978, issue of the weekly tabloid. According to author John Cooke (like most *NE* staffers, an expatriate Britisher getting training in American tabloid press techniques), a Japanese psychic named Koichi Mita "mentally projected an image of the moon's dark side onto a photographic plate—26 years before anyone ever saw it." The picture, which was made in November 1933 in Gifu City, Japan, was confirmed by the Russian moon probe Lunik-3 in October 1959, claims the article.

"Psychic" photographs are no strangers to the CSICP, as witness the claims (and exposures) of Ted Serios, Uri Geller, Masuaki Kiyota, and others. What is novel about this new claim is that the photo was allegedly made decades before anyone knew what should have been seen there.

(To be picky, anyone can project an image of the moon's dark side onto any piece of film, since the moon's dark side is black, as is the color of exposed film. Cooke was simply confusing the popular, but incorrect, term "dark side of the moon" for the more correct "far side of the moon." Scientists sending photographic probes make sure that they pass over the target when the near side is dark and the far side is consequently sunlit; otherwise the photographs would not turn out.)

According to Japanese psychic researchers, the "thought" photograph (or "nengraph") had been held under strict controls since it was made. Unfortunately, no records of the original session seem to exist, since Gifu City was burned to the ground during an allied air raid in 1945, but somehow the photo survived. Why it should have been so carefully guarded is puzzling, since it is hard to imagine that its custodians would think that it would ever be verified. Flights to the moon were considered to be a century or more away.

The most disturbing aspect of the whole business is that the nengraph does look very much like one of the Lunik-3 photos, but there is one



Alleged "thought photo" of moon's far side.

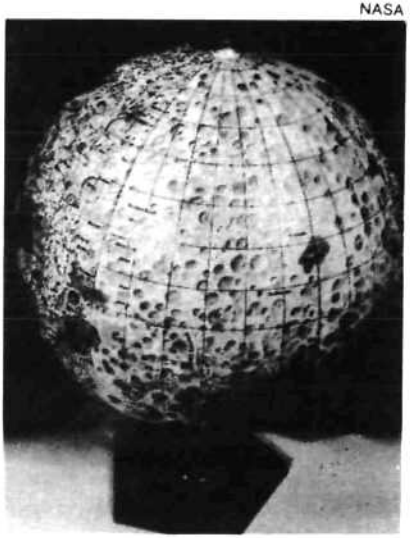
Lunik 3 photo of moon's far side (1959).

NASA

problem: the Lunik-3 photos do not look much like the moon. As confirmed by later American flights, the Lunik-3 photos are of such poor quality, are so blotchy and washed out, and have so many extraneous features and errors (an entire mountain range, proudly called the "Soviet Mountains," turned out to be a data-transmission error), that they are poor reproductions of the actual view of the far side of the moon.

But there they are, blotches and all, on the alleged 1933 thought photograph. Not even considering the remarkable similarity of the two photos (the angle of view, range, lighting conditions, and numerous other variables are identical), the contents alone lead a skeptic to suspect that the purported 1933 nengraph is a clumsy forgery of the 1959 Russian photo, subsequently placed under the "strict controls" of the original (if, indeed, it ever existed). Such a trick is a classic one in the world of conjuring, particularly when enthusiastic scientists are the ones enforcing the controls.

"There's no room for any doubt in this case," asserted Toshiya Nakaoka, chairman of the Japanese Association for Psychotronic Research and allegedly director of the Fukurai Institute of Psychology in Niizakadori. (My letters sent to that address were returned "addressee unknown.") A psychic researcher for more than 30 years, Nakaoka was quoted as saying, "Mita gave a demonstration of two types of paranormal ability, out-of-body travel and nengraphy. There is no doubt this nengraph is the same one made in 1933."



Russian lunar globe (1968) based on Lunik 3 photo shows illusory features disproved by later American probes. The band of dark maria (seas) in lower left and lower right of nengraph and Lunik photo do not in fact exist.

But even proving that the 1933

nengraph (whenever it was really made) is actually a copy of the 1959 photograph and *not* really another view of the far side of the moon (since the actual date of the nengraph session was lost when the records were destroyed, it's impossible to compare the phases of the moon on the photos) will probably not dampen the enthusiasms of the psychic researchers. In *that* case, if Mita did not make an out-of-body voyage, he performed an even more astounding feat: precognition of the newspapers of 1959 that carried the Russian photo. QED, the paranormal world triumphs again.

—James Oberg

Schools get pro-UFO reader

Prentice-Hall of Canada, not to be outdone by Prentice-Hall of the United States (those folks who gave the public Jay Anson's *The Amityville Horror, A True Story*, a book about a house "haunted by ghosts"), has published for our students a French-language reader entitled *Les OVNI*, by Bernard Lecerf and Ian Robinson.

Designed for use by English-speaking high school students in Canada (and, quite likely, the United States), particularly those who've had about two years of French, this reader contains twelve chapters of narrative on such UFO "mysteries" as the Betty and Barney Hill testimony, the Socorro, New Mexico, incident, and the Thomas Mantell accident of 1948.

The book opens with the high-interest, low-credibility "contactee" account of Betty and Barney Hill. And this opening ends with the loaded and unloaded comment: "From where do these beings with mysterious powers come? Is extraterrestrial life possible?"

But just in case the student missed something Betty and Barney *said* (and UFOlogists have written), the authors present lessons that ask the student to arrange in chronological order the story of the "Unexpected Visitors."

In the narrative on the Mantell accident, the authors close with the statement: "American Air Force files explain the Mantell accident with the phrase, 'died in pursuit of a UFO.'" This, despite the fact that careful investigators agree that Mantell's F-51 crashed as a result of his high-altitude pursuit of a Navy skyhook balloon.

Only three of the twelve chapters contain a framework that has some scientific basis. Unfortunately, even these chapters do not sufficiently separate scientific fact from scientific speculation.

For instance, the chapter "A Little History" would have us believe that Ezekiel observed four extraordinary objects. (There is no mention of Menzel's meteorological explanation.) The chapter "Frontiers of the Universe" claims a radio telescope is an instrument for discovering stars and galaxies, and concludes by begging the question: "Are UFOs manifestations of voyagers from other galaxies?"

The book includes vocabulary lessons at the end of each chapter, a glossary, and a bibliography of sources on the UFO subject. Of the fifteen sources listed in the bibliography, only three contain what I consider quality critical analyses of the UFO "evidence."

Noticeably absent from the book is information about authors Lecerf and Robinson.

On the surface, the book might appear to have interest to some students. And the authors attempt to balance the bias with four chapters for belief in UFOs, four chapters against, and four chapters "neutral."

Yet it is clear that this French-language book is really a UFO book with a believer slant. The title page has the following quotation attributed to American astronaut Ed Mitchell: "We know they [UFOs] exist; the only problem is to know where they come

from."

Page 69 of this book contains the narrative statement: "All these observations suggest an advanced technology." Page 70 has a heading "UFOs—Friends or Enemies?" and the question: "But why do these visitors come to see us?"

And the final chapter, entitled "If You See a UFO," includes a checklist that resembles information commonly found in field investigators' manuals published by private UFO organizations.

Had *Les OVNI* been published by the editors of a tabloid commonly displayed on grocery checkout counters, I wouldn't be so frustrated. But by the editors of a reputable publishing house? And for use in language classes in secondary schools?

Perhaps most instructive is the reaction of the French-language teacher at the high school where I teach, a person uninterested in paranormal subjects. Upon examining *Les OVNI*, she commented: "It's bizarre. I wouldn't use it."

—*Elmer Kral*

Elmer Kral is co-chairman of the Education Subcommittee of the CSICP.

Belief and selective exposure

The selective-exposure hypothesis suggests that persons who believe in flying saucers will actively seek out information supporting their beliefs. To test this notion, Laura Otis of the Graduate Programme in Psychology at York University compared answers to UFO-related questions from persons waiting to see the film *Close Encounters of the Third Kind* with answers to the same questions from persons waiting to see two control films, *The Gauntlet* and *Saturday Night Fever*. A total of 243 patrons (90 percent of those approached) answered questionnaires at each of three theaters.

Persons in line to see *Close Encounters* were far more strongly disposed to believe in flying saucers than those at the other two films, Otis reports in the March 1979 *Journal of Psychology* (101: 293-95). They were more likely to agree with these two statements on the questionnaire: (1) "There are such things as flying saucers (vehicles for intelligent beings from outer space," and (2) "Life on earth is being observed by intelligent beings from outer space."

"The results confirmed the selective prediction that believers in flying saucers would be overrepresented at the film supporting their beliefs," says Otis. "One likely consequence of this kind of selective exposure is that those who are predisposed to accept the reality of paranormal phenomena will have their beliefs confirmed and reinforced by the current growth of material promoting belief in the paranormal. Insofar as people are not exposed to alternative information and points of view, public credulity regarding paranormal phenomena may be expected to increase still further in the future."

—*K.F.*

Psychic Vibrations

For the past several years, the government of the tiny Caribbean island nation of Grenada, under Prime Minister Sir Eric Gairy, had waged a one-island campaign to create an official United Nations committee to deal with the "urgent global problem" of UFOs. Gairy had made numerous trips to New York to coordinate his UN UFO strategy, parading before that organization such prominent UFO proponents as J. Allen Hynek, Jacques Vallee, Stanton T. Friedman, and former NASA astronaut Gordon Cooper, all of whom emphasized the great wisdom of Gairy's position. (However, the UN's reaction was invariably a colossal yawn.) Grenada had even issued UFO postage stamps, bearing UFO contactee George Adamski's famous but discredited flying-saucer photo, which is widely believed to be a slightly out-of-focus photo of a chicken brooder.

This past March, without any warning, during one of Gairy's many trips to New York, a coup deposed Grenada's esteemed Prime Minister, and a new government was installed under Maurice Bishop. No squadron of UFOs swept down from the sky to defend their champion in his hour of need. The new government claimed to have discovered in Gairy's residence the bodies of small animals and other paraphernalia associated with witchcraft and voodoo. The *Washington Post* reported that the new government had pledged to give up the "mysticism, magic, and flying saucers" that made Grenada "a laughing stock" under Gairy.

But believers in UFOs should not despair: the government of yet another fledgling world superpower, the Republic of Equatorial Guinea, has recently issued its own postage stamps bearing the famous Adamski Chicken Brooder UFO, under the banner "*Colaboracion Interplanetaria.*"

* * * * *

We've seen quite a number of explanations for the famous vision of Ezekiel in the Old Testament. The late astronomer Donald H. Menzel suggested meteorological optics, but a flurry of recent explanations have been of the "ancient astronaut" variety (von Däniken, Blumrich, etc.). Now Waukegan, Illinois, accountant Ronald A. Pokatiloff has turned up a new wrinkle in the old question, with his privately published book, *Was God a Future American Spaceship?* Pokatiloff suggests that Christ was in fact an American astronaut who traveled back in time in a not-yet-developed NASA time machine and preached of the Kingdom of God (which, it turns out, is none other than

the United States of America). His reasoning is thus: The ancient Hebrews possessed some apparently sound concepts concerning diet and hygiene. Modern medical science has learned of these things by studying the practices of the Jews. NASA's astronauts have thus gone (or maybe will someday go) back in time to give this knowledge to the ancient Hebrews, who will thus pass it on to later ages, et cetera. Pokatiloff refuses even to try to grapple with certain obvious questions, such as what if one of these "astronauts" killed his own direct ancestor—would he then vanish in a puff of smoke, only to reappear when his ancestor comes back alive due to the fact that the man who killed him has never existed? "My theory is like Charles Darwin's," says Pokatiloff. "His was radically different, at the time, and so is mine."

* * * * *

The latest news from Erich von Däniken: That celebrated proponent of "ancient astronauts" now claims to know the whereabouts of certain South American underground cities, where the lights never go out, containing the "living dead" bodies of four ancient astronauts, each encased in a translucent sarcophagus. "This should be the ultimate proof," von Däniken told the *National Enquirer*. Furthermore, it seems that some extraterrestrial hardware in these underground sites has begun signaling that the "gods" are now on their way back to earth. Von Däniken has revealed that this summer he will lead an expedition to this region and bring back the ultimate proof. Everyone here is waiting anxiously.

* * * * *

"Scientific" parapsychologists D. Scott Rogo and Raymond Bayless have recently discovered a startling fact: that dozens of people have had telephone calls from the dead. "The weight of evidence has convinced us that there are surviving spirits making attempts to contact living people" through the telephone, Bayless told the *National Enquirer*. Their new book, *Phone Calls from the Dead*, describes fifty such cases. Unfortunately, if the person receiving the call realizes that he is speaking to a spirit from the Beyond, the call is usually over within seconds, they say. Some postmortem calls arrive, appropriately enough, over dead telephone lines. Rogo believes that these calls occur when a spirit manipulates electrical impulses in the phone to reproduce the sound of its own voice. "We've stumbled on a whole new method of psychic communication!" says Rogo.

* * * * *

What was the mysterious ailment afflicting the workers at a shoe factory in Huntington, West Virginia? On the first day, four workers fainted. Soon they were "dropping by the dozens." Could it be the mysterious Legionnaire's Disease? Workers thought they were being overcome by toxic fumes from a new

batch of glue. The plant was closed, and federal investigators moved in. The government found the source of the mysterious disease: "assembly-line hysteria." The fainting and dizziness was the result of hyperventilation—overly fast breathing because of fear. Among the clues that made investigators suspicious: the sickness was most severe among those workers most dissatisfied with their jobs.

* * * * *

Sometimes would-be UFO debunkers make pronouncements just as absurd as those of the true believers. In the Soviet journal *Aviatsiya I Kosmonavtika*, M. Dimitriyev, Doctor of Chemical Sciences, has published a scholarly analysis of the famous "jellyfish UFO" sighted over Petrozavodsk, USSR, on September 20, 1977. His explanation? "Chemiluminescent zones in the atmosphere," more prosaically known as glowing smog. Readers of this publication, however, know otherwise; as James E. Oberg revealed (Fall/Winter 1977, p. 10), the sighting of the supposed UFO corresponds precisely with the rare nighttime launch of the Soviet military spy satellite Cosmos 955. However, since that satellite was launched from the officially secret Soviet space center at Plesetsk (whose existence has been reported practically everywhere except in the controlled Soviet press), Soviet authorities have been caught in a delicate situation: the space center at Plesetsk does not exist, but UFOs cannot exist either. Comrade Dimitriyev resolves the problem nicely: it was "glowing smog" that everyone saw, and not the launch of Cosmos 955. The narcotic effect of "Chemiluminescent zones" also explains the disappearance in 1945 of six U. S. Avenger aircraft in the "Bermuda Triangle," according to Dimitriyev. "Swampski gas," laughs Oberg. Lysenkoism is not yet dead—science remains subordinate to Party orthodoxy in the USSR. •

The Moon and the Maternity Ward

George O. Abell
and Bennett Greenspan

The role of the moon as the principal raiser of tides on the earth has been known for many hundreds of years and was first explained in terms of gravitational theory by Isaac Newton in the seventeenth century. Actually the gravitational force of the sun on the earth is more than 100 times stronger than that of the moon; but because the moon is nearer, the difference between its gravitational pull on the side of the earth nearest it and the pull on the other side farthest from it is greater than the corresponding difference in the sun's pull by a factor of about 2.5. Consequently, while the sun also plays a role in raising tides, the moon's role is dominant.

The importance of the moon in producing solar eclipses has been known for thousands of years; and similarly, eclipses of the moon, which occur on those infrequent occasions when the full moon enters the shadow of the earth, have been known since antiquity. Indeed the correct explanation of eclipses is found in the writings of Aristotle and must have been known much earlier.

Sunlight reflected to the earth from the moon, especially when the moon is near full, has been an important influence on man's affairs since antiquity. The harvest moon, for example, which occurs in autumn, when the angle that the moon's rising path makes with the horizon is such that

George O. Abell is professor of astronomy at the University of California, Los Angeles.
Bennett Greenspan, M.D., is with the Department of Radiology, University of California, Los Angeles.

there can be bright moonlight in the early evenings for several days in a row, has been a longtime boon to farmers. Obviously, the bright light of full moon is an aid to certain nighttime activities, just as the time near new moon, when the sky is darkest at night, is optimum for other activities, such as astronomical observations of faint objects. Song and poetry are full of allusions to the moon as an aid to romance. Perhaps there are psychological effects of the moon upon man as well.

The few obvious effects, such as tides and eclipses, and other spectacular phenomena associated with the moon give rise to a vast amount of lunar folklore and superstition. It has been claimed, for example, that crops fare best when planted just after full moon. The full moon has been associated with fertility, with women's menstrual cycles, with violence, especially murder and suicide, with incidences of epilepsy, with evil spirits, with madness, and even with lycanthropy (the curse of the werewolf). For a sensational, if rather inaccurate, account, see *Moon Madness* (Abel, 1976).

Many of the alleged influences of the moon are often cited as evidence that celestial bodies (the moon, at least) can affect humans and their affairs, and thus as support for astrology.*

Full Moon and the Time of Birth

One of the most widely held beliefs about lunar effects is that there are many more human births at the time of full moon than at other times of the lunar cycle. The belief is even widespread among nurses in maternity wards and among some gynecologists as well. One of our colleagues recalls that his first child was born during full moon and that when he arrived at the hospital there were expectant women waiting in the halls for available rooms; the nurses all explained that "it always happens this way" at the time of full moon. Astrologer Sydney Omarr frequently refers to the incidence of crime and violence, as well as the higher birthrate, at the time of full moon and recommends that the moon be saved for romance.

There are some published studies that seem to support the idea that the full moon favors a higher than average rate of births. E. J. Andrews (1960), for example, reports that in the Tallahassee Memorial Hospital during the period 1956 to 1958 there were 401 babies born within two days of full moon, 375 within two days of new moon, and 320 within two days of first quarter. In a study of more than 510,000 births in New York City during the ten-year period beginning in 1948, Menaker and Menaker

*It must be noted, however, that these alleged lunar influences on humans are not, in general, the ones that would have been predicted from the appearance of the moon in the natal horoscope—the chart showing the positions in the heavens of the planets at the time and place of the birth of an individual.

(1959) claim that the birthrate was about one percent higher during the two weeks following full moon than before. However, one of those authors (Menaker, 1967) later studied another half-million births in New York during 37 lunar months from 1961 to 1963 and reported a one percent excess in the birthrate during the two-week period *centered* on full moon. Subsequently, Osley, Summerville, and Borst (1973) reported on a study of yet another half-million births in New York, during a later unspecified three-year period, showing a one percent excess in the birthrate during the two weeks *preceding* full moon. In contrast, Rippmann (1957) analyzed 9,551 natural births over a ten-year period in Danville, Pennsylvania, and found no correlation at all with the phase of the moon.

Again astrologers invoke the alleged influence of the full moon on the birthrate as evidence that celestial bodies can affect human affairs. It is not clear, however, how such a correlation would have anything to do with the interpretation of natal horoscopes according to the rules of Ptolemy (handed down from the second century) by which astrologers interpret the personalities and predict the futures for those individuals.

Still, if true, any correlation between the birthrate and the phase of the moon would be a very surprising result. Moreover, if properly interpreted, such a correlation would tell us something of the greatest importance to our understanding of the human reproductive cycle, to say nothing of influences over a distance of a quarter of a million miles that evidently have nothing to do with any of the known forces of nature. Thus we felt that the matter was worth a very careful check. Our analysis has been reported in the *New England Journal of Medicine* (Abell and Greenspan, 1979).

Data

We have tallied all births, live and dead, from the records of the UCLA Hospital maternity ward during the period March 17, 1974, to April 30, 1978. In some instances a birth would occur at home before the mother left for the hospital or en route to the hospital. To be consistent, we counted only births that actually took place in the hospital. During that interval there were 11,691 live births at the hospital. Of these, 3,549 were induced (by drugs or Caesarean section), leaving a total of 8,142 births that occurred naturally. To take account of the possibility that inducing a birth might have caused it to occur on a date earlier than normal, we treated total live and natural births separately. During the same interval there were 141 instances of multiple births, all of which were twins except for four sets of triplets and one set of quadruplets. In some of these multiple births, one of the infants was born before the mother reached the hospital. Finally, there were 168 stillbirths—amounting to 1.4 percent of the total.

The Lunar Phase

The average time that the moon requires to pass through a complete cycle of phases—that is, from new moon to new moon, or full moon to full moon, an interval known as the *synodic month*—is 29.530588 days. Because our birth data are recorded by calendar days (midnight to midnight) we had to divide our period of 1,506 days into synodic months of either 29 or 30 days. Our procedure was as follows.

The local date of each full moon during the interval was obtained

TABLE 1
Live Births at UCLA Hospital, March 17, 1974, to April 30, 1978

Phase Day	Total Live Births	Natural Live Births
1	406	273
2	390	273
3	425	291
4	412	287
5	391	270
6	396	282
7	399	293
8	398	276
9	383	260
10	380	271
11	364	243
12	398	292
13	372	261
14	411	279
15 (Full)	385	268
16	397	270
17	397	276
18	401	290
19	394	278
20	416	303
21	371	241
22	383	252
23	397	268
24	411	294
25	385	265
26	423	305
27	418	280
28	405	285
29	372	264
30	211	152
Totals	11,691	8,142

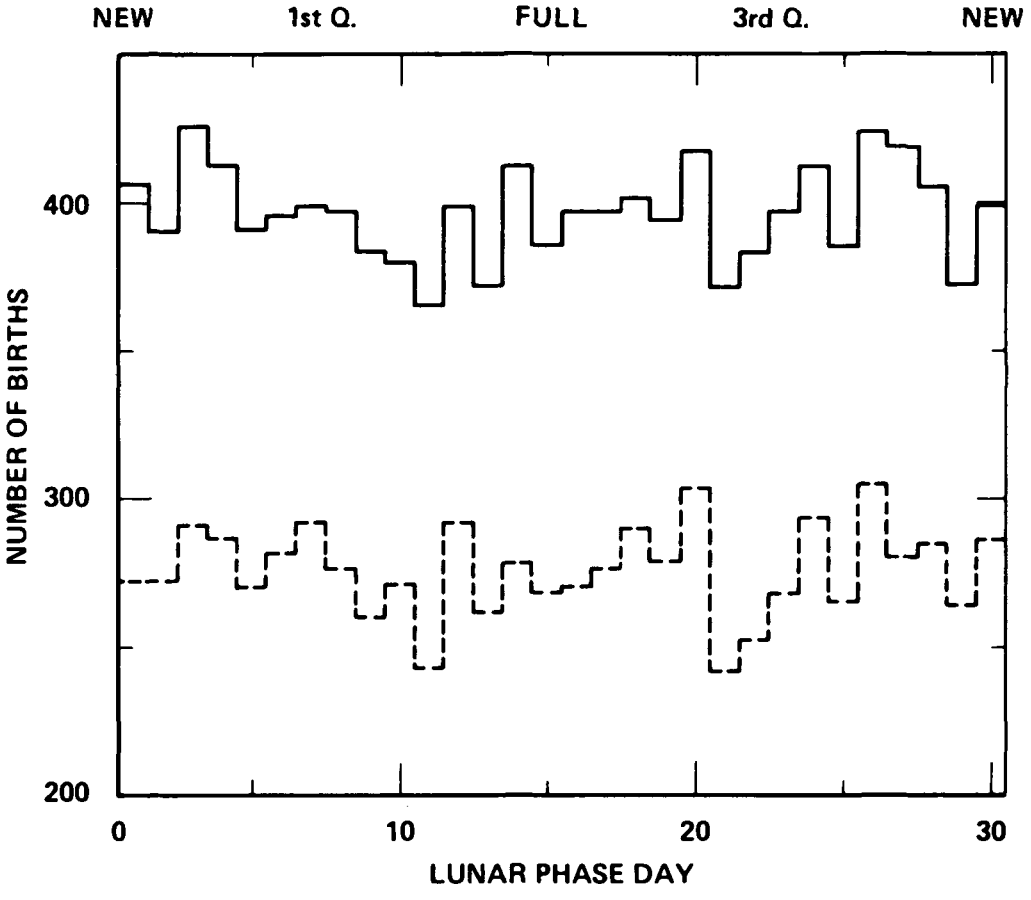


FIGURE 1. The numbers of total live births (solid line) during a four-year period at the UCLA Hospital plotted against lunar phase, and the numbers of natural live births (dashed line) during the same period.

from the U.S. Naval Observatory's annual publication *The American Ephemeris and Nautical Almanac*. In each case we took the local date in Los Angeles (between midnight and midnight, either Pacific Standard Time or Pacific Daylight Time, as appropriate). We defined the date of full moon as the fifteenth day in the lunar cycle. The previous day would then be lunar day number 14, and the day before that lunar day number 13, and so on. Thus by counting back 14 days from the date of full moon, we obtain day 1, which we define as the beginning of the lunar cycle; it is approximately the date of new moon. By counting forward from full moon, we define day 16, 17, and so on, until we reach the beginning of the next lunar

cycle. In this way we determine whether the particular cycle has 29 or 30 calendar days. In the 51 synodic months over the period we surveyed, there were 27 30-day months and 24 29-day months. Thus the mean length of the synodic month covered in our sample was 29.529412 days—very close to the known mean length of the synodic month.

Results

We next totaled all of the births that occurred on a first day of a lunar cycle, on a second day of a lunar cycle, and so on. These figures for the total number of live births, and also the noninduced, or natural, live births, are displayed in columns 2 and 3 of Table 1, and are displayed in Figure 1. The much smaller totals corresponding to the thirtieth day in the lunar cycle are not due to an avoidance of the day before new moon but to the fact that there were only 27 30-day months among the 51 synodic months surveyed. (In Figure 1, the totals for day 30 have been increased by the factor 51/27 so that they could be compared with the data for other dates.)

There are no obvious peaks in the numbers of births either at full moon or at any other time in the lunar cycle. There are, of course, small fluctuations in the actual total numbers of births among the successive days of the lunar cycle, but such random fluctuations are expected.

We can, in fact, use a standard statistical test to check the hypothesis that day-to-day fluctuations as large as those observed would be obtained in a random sampling from a hypothetical population in which births occur uniformly throughout the lunar cycle. If, in fact, the phase of the moon has no effect whatsoever on numbers of births, we would expect a total number of live births on each day during the period covered that is close to the average number of 395.91, except for day 30 when the expected number would be only 209.60 (which is 27/51 of 395.91). The corresponding expected numbers of natural, or noninduced, births are 275.73 and 145.97, respectively. The standard χ^2 test shows that, for the total numbers of all live births, fluctuations from day to day in the lunar cycle at least as large as those obtained here would be found about 95 percent of the time. Fluctuations in the day-to-day totals of natural births as large as those found here would occur 65 percent of the time. In other words, fluctuations such as those we have obtained are entirely to be expected, and there is no reason whatsoever to ascribe any influence to the moon on the numbers of births during the lunar cycle.

Multiple Births

The numbers of multiple births occurring during the period March 17,

TABLE 2
Multiple Births and Stillbirths at UCLA Hospital, May 17, 1974, to April 30, 1978

Phase Day Range	Number of Multiple Births	Number of Stillbirths
3-7	27	26
8-12	27	33
13-17	15	23
18-22	24	26
23-27	31	30
28-2	17	28
Totals	141	166

1974, to April 30, 1978, are given in column 2 of Table 2. The numbers in Table 2 refer to the number of instances of multiple births (that is, sets of twins), whether or not one of the twins may have been born before the mother reached the hospital; the numbers do not refer to individual births. We have grouped the numbers of multiple births in 5-day intervals in the lunar cycle to obtain numbers of births large enough to make meaningful comparisons. Note that the interval containing full moon (day 15) contains the lowest number of incidences of multiple births of any of the intervals. However, this minimum is not significantly different from fluctuations expected by chance.

If the incidence of multiple births is completely unaffected by the phase of the moon, we would expect the 141 sets of multiple births to be distributed evenly among the intervals with a mean number per interval of 23.87, except for the interval containing day 30, for which the expected number of multiple births is 21.63. Again we used the χ^2 test to compare the actual incidence of multiple births with the expected ones and found that fluctuations as large as those observed here would occur 20 percent of the time. In other words in one-fifth of all such experiments as this we would find fluctuations from the expected numbers at least as large as those we have obtained. There is, therefore, no reason to ascribe to the moon any effect on multiple births.

Stillbirths

The distribution of 168 stillbirths among the same six 5-day intervals in the lunar cycle is exhibited in column 3 of Table 2. Again, the number of stillbirths obtained during the interval containing full moon is actually the

lowest in the list. But again, there is no significance to these small fluctuations. The expected number of stillbirths, if the moon has no effect, is 28.108 for all of the intervals except the one containing day 30, when the expected number should be 25.462. A χ^2 test shows that fluctuations of the size obtained here would occur 78 percent of the time.

Conclusions

Our analysis of the nearly 12,000 live and dead births occurring at the UCLA Hospital maternity ward in an interval of 51 lunar months from 1974 to 1978 reveals no correlation between the numbers of births and full moon or any other phase of the moon. This negative result occurs whether we consider all live births, just those that are completely uninduced (that is, natural), incidence of twinning or other multiplicity, or even stillbirths.

These results were a considerable surprise to several of the nurses at the UCLA Hospital maternity ward: for they, like so many others, fully expected to find a strong correlation of birthrate with full moon. To be sure, if one combs through all of the data, an occasional lunar month can be found in which there is a greater than average number of births at or near full moon, but these are only random fluctuations; there are just as many months in which there are fewer than the expected number of births near full moon. Probably the nurses simply remember those months in which they noticed there was a full moon during a particularly busy night. Perhaps it is similar to the tendency to remember those dreams that seem to come true and forget the vast majority that do not.

Our results appear to be at odds with some of the published surveys referred to above. At least among those mothers in the Los Angeles area who are cared for at the UCLA Hospital there appears to be no influence of the moon whatsoever on the times of their deliveries. We strongly suspect that the moon has no influence on birthrates anywhere in our society and are perplexed at the seemingly discordant results, especially those obtained in the New York samples. Because three of those studies purport to cover approximately a half-million births each, a very substantial amount of effort would have been required to carry out the tests properly. Especially in view of their discordant results, perhaps a new look at those data would be appropriate.

We know of other cases where claims of effects of the full moon have not been verified by careful statistical studies. Among these are Pokorny's (1964) study of 2,497 suicides and 2,017 homicides in Texas between 1959 and 1961; Pokorny and Jachimczyk's (1974) analysis of 2,494 homicides in Texas between 1957 and 1970; Lester, Brockopp, and Priebe's (1969) analysis of 339 suicides in Erie County, New York; and Pokorny's (1968)

analysis of 4,937 mental hospital admissions—none of which shows any correlation either with the phases or the distance of the moon.

The moon has unquestioned influence on the tides and on certain other phenomena, but several pieces of evidence at hand suggest that many of the "incredible facts" about the influence of the moon on man are simply not facts at all.

References

Abel, E. C. 1976. *Moon Madness.* Greenwich, Conn.: Fawcett.

Abell, G. O., and B. Greenspan 1979. "Human Births and the Phase of the Moon." *New England Journal of Medicine* 300: 96.

Andrews, E. J. 1960. "The Cyclic Periodicity of Postoperative Hemorrhage." *Journal of the Florida Medical Association* 45: 1362-1366.

Lester, D., G. W. Brockopp, and K. Priebe 1969. "Association Between a Full Moon and Completed Suicide." *Psychological Reports* 25: 598.

Menaker, W. D. 1967. "Lunar Periodicity with Reference to Live Births." *American Journal of Obstetrics and Gynecology* 98: 1002-1004.

Menaker, W., and A. Menaker 1959. "Lunar Periodicity in Human Reproduction: A Likely Unit of Biological Time." *American Journal of Obstetrics and Gynecology* 77: 905-914.

Osley, M., D. Summerville, and L. B. Borst 1973. "Natality and the Moon." *American Journal of Obstetrics and Gynecology* 117: 413-415.

Pokorny, A. D. 1964. "Moon Phases, Suicide, and Homicide." *American Journal of Psychiatry* 121: 66-67.

____ 1968. "Moon Phases and Mental Hospital Admissions." *Journal of Psychiatric Nursing* 6: 325-327.

Pokorny, A. D., and J. Jachimczyk 1974. "The Questionable Relationship Between Homicides and the Lunar Cycle." *American Journal of Psychiatry* 131: 827-829.

Rippmann, E. T. 1957. "The Moon and the Birth Rate." *American Journal of Obstetrics and Gynecology* 74: 148-150. •

Biorhythm Theory: A Critical Review

Terence M. Hines

The popularity of biorhythm theory has grown rapidly in the past few years. According to biorhythm theory, by determining in which phase a person is in their three separate sinusodial cycles (a 23-day physical cycle, a 28-day emotional cycle, and a 33-day intellectual cycle), predictions can be made about which days will be best (or worst) for engaging in numerous types of activities. A person's performance is claimed to be better on good, or "up," days, which make up the first half of each cycle, and worse on the "down" days of the second half of the cycle. Days on which a rhythm is shifting from the up to the down phase (or vice versa) are termed "critical days," and performance is supposed to be especially bad on these days. The worst type of day, according to biorhythm theory, is the dreaded "triple-critical day," when all three cycles are shifting phase on the same day. Although its popularity is rather recent, biorhythm theory has a history dating from the 1880s. Gardner (1966) has provided a fascinating account of that history.

Many claims have been made in the popular press and by those selling various biorhythm books and devices (slide rules, games, calculators, etc.) that biorhythm theory has been scientifically validated in studies that allegedly show that about 60 percent of accidents caused by human error occur on critical days. Since critical days make up only about 20 percent of all days, this certainly would be an impressive finding, if true. However, in the past several years much empirical work on biorhythm theory has

Terence M. Hines is an experimental psychologist with the Department of Neurology, Cornell University Medical College, New York City.

shown that the claims made for the theory are without foundation. The present paper reviews this work.

Evidence Used to Support the Biorhythm Theory

The evidence used to support the validity of biorhythm theory can be roughly divided into two types. First, lists of disasters, such as airline crashes and deaths of famous persons, that seem to follow the pattern predicted by biorhythm theory are reported. Thus, aircrashes that took place when the pilot (or co-pilot) was on a down or critical day are said to support the theory. So are lists of famous people who died on such days. While many such cases can be found if one searches long enough, they alone provide no evidence whatsoever of the validity of the theory. Before concluding that biorhythm has anything to do with such events, one must take into account the number of times such events take place when biorhythm theory predicts they *won't*. Such cases are conveniently ignored by biorhythm proponents.

Seemingly more impressive evidence for biorhythm theory comes from studies that claim to show that an impressive number of accidents occur on critical days when compared with the number of occurrences expected by chance. Such studies are often (1) impossible to find, and thus impossible to verify; (2) contain only an assertion that a significant effect of biorhythm was found without providing sufficient detail to check the claims; or (3) contain grievous methodological and/or statistical errors, rendering the conclusions drawn from the data worthless.

Regarding the first type of study, the kind that are impossible to find, the most widely cited supposedly were carried out in Japan and found that about 60 percent of accidents fell on critical days. But Katz (1977) states that the *Toronto Star* "was unable to locate any of the original studies referred to by the biorhythm promotional literature. The Japanese Embassy in Washington, D.C., the Japanese Trade Center and the Japanese Chamber of Commerce in New York all stated that they were unaware of any Japanese firms employing biorhythm." Another example of what might be termed a "phantom study" was cited by Pittner and Owens (1975): "The Canadian Armed Forces concluded after a 7,000 case study that there is a definite relationship between accidents and critical days" (p. 44). Unfortunately, no reference for this study was given. Colonel J. Boulet, director of information services for the Canadian Department of National Defense, in a letter to me dated July 20, 1978, stated: "A search to locate the report of the biorhythm theory study allegedly carried out by the Canadian Forces proved negative."

A report by Anderson (1973) is an example of the "assertion only"

type of study claiming to support biorhythm theory. Anderson devotes only one paragraph of his four-and-a-half-page paper to his claim that "we have analyzed more than 1,000 accidents during the past two years, and the amazing thing is that we have come out with more than 90 percent of the accidents occurring on critical days" (p. 19). Anderson presents no information whatsoever on the method used for picking the analyzed accidents, the method for computing critical days (a most important point, to be discussed later), or any other details of how the results were arrived at.

Finally, I will give two examples of studies claiming to support biorhythm theory that present a more detailed description of the methods of data analysis used. These studies contain errors that totally invalidate the conclusions drawn from the data. The first is by Pittner and Owens (1975). These authors analyzed accidents involving human error from the records of the Safety Office of the Army Corps of Engineers, Philadelphia District, for fiscal years 1971 through 1974. "A total of 51 accidents were computed; and of these, approximately 35 percent (18 accidents) occurred on critical days" (p. 45). If this finding were true, it would be supportive of biorhythm theory, for it is significantly different from chance. Happily, Pittner and Owens included a tabulation of the day on each of the three biorhythm cycles on which each accident occurred (their Figure A, p. 44). An examination of their raw data shows, amazingly, that only 13, not 18, accidents occurred on critical days. The number of accidents out of 51 that should fall on critical days by chance alone is 12. The chi-square for the occurrence of 13 accidents results in a figure of $\chi^2 = 0.11$ ($df = 1$, $p < .85$). This is not even close to being significantly different from chance. Thus, the actual results of the Pittner and Owens study show no support for biorhythm theory at all, in spite of what the authors, incorrectly, claimed their data showed. Unfortunately, Pittner and Owens's erroneous conclusions have been reported elsewhere (Brownley and Sandler, 1977) as supporting biorhythm theory.

Where did the extra five critical-day accidents come from in Pittner and Owens's study? Clearly it is not just a misprint, since 35 percent of 51 is approximately 18. These authors may have done what is fairly common in biorhythm studies; they must have included not only critical days but also one day before and one day after critical days (critical day plus and minus one). That is done because "an individual born shortly following midnight is actually biorhythmically closer to the preceding day than an individual born at noon. Similarly, an individual born approaching midnight is closer to the coming day" (Williamson, 1975, p. 18). As long as such a procedure is made explicit, there are no problems. However, it is easy for those not trained in statistical methodology to include accidents falling on the critical day plus and minus one and then compare the total figure to the

number of accidents expected to fall only on the actual critical day by chance. Such a procedure obviously results in a serious error with a seemingly very impressive number of critical-day accidents, a number much higher than expected by "chance" when the chance figure that is used is that for a single critical day. It is interesting to note that about 60 percent of a random sample of accidents will fall on a critical day plus and minus one by chance alone. Many of the phantom studies said to support biorhythm noted above claim that about 60 percent of accidents occur on critical days.

Williamson falls directly into this trap. After stating that "critical days comprise only 20 percent of the total," he says, "Days considered to be critical are the calculated critical days plus or minus one." He then evidences surprise that out of 33 accidents, 58 percent fell on a critical day. Of 13 helicopter accidents, 61 percent occurred on the pilots' critical days. Since "critical day" here means the actual critical day plus and minus one, these results are exactly what would be expected by chance alone and show no support for biorhythm theory.

Another statistical problem in some biorhythm studies is what may be called the "shotgun" approach. In such a study, the investigator tests all possible biorhythm predictions and, when one or two turn out to be verified by statistically significant differences in the data, he claims that this supports biorhythm theory. It does not. Consider a paper by Knowles and Jones (1974). These authors examined the incidences of altercations between police and suspects for any biorhythm effects. When comparisons were made regarding the occurrence of such incidents on officers' critical days, no significant effects were found. However, the authors then went on: "All relationships of patterns of days and periods for each of the three cycles" were examined for both officer and suspect. The author can't mean this literally as there is a simply huge number of different such patterns. Even considering the simplest cases, a given rhythm can be in one of five different patterns: (1) up phase, on ascending portion of curve; (2) up phase, descending portion; (3) down phase, ascending portion; (4) down phase, descending portion; and (5) critical. Since there are three rhythms and two persons involved in each altercation, that gives 5^6 or 15,625 different possible patterns to be examined. Knowles and Jones never state exactly how many patterns they examine, but since they apparently had access to a computer it may have been a great many. Thus the fact that they found significant effects on four comparisons out of however many they ran is really not terribly supportive of biorhythm theory. It is even less supportive when one remembers that the major claims of the theory, regarding critical days, were not confirmed.

Thus it appears that the evidence claiming to support biorhythm

theory does not stand up to close inspection.

Studies Failing to Support Biorhythm Theory

With the great popularity of biorhythm theory, a number of attempts have been made to assess its validity using adequate (and often quite elegant) statistical and experimental paradigms. I shall now review these studies. They uniformly offer no support whatsoever for the claims of biorhythm enthusiasts.

Accident occurrences. A fairly early study of biorhythm and accidents was carried out by Mason (1971) for the Workers' Compensation Board of British Columbia. Mason examined 13,285 accidents from the Board's files. This included all time-loss accidents occurring during the first four months of 1971. Accidents were no more likely to occur on critical days than on noncritical days. Further, various combinations of critical and noncritical days did not yield accident rates higher than chance. A possible criticism of these results is that the sample included all accidents, not just those due to human error, and that the inclusion of accidents not caused by human error reduced the effect of biorhythms. Two points answer this criticism. First, the addition of other than human-error accidents could be expected to weaken any effects of biorhythms but not to eliminate it totally. After all, human error plays some role in a large percentage of all accidents. Second, when the entire sample of accidents was divided into those more likely to be the result of human error and those less likely, no effects of biorhythm were found for either subsample.

Sacher (1974) performed a study of the effects of biorhythms on aircraft mishaps, using 4,346 accidents involving naval aircraft between 1968 and 1973. Again, no significant effects of pilots' position on the various biorhythm cycles were found.

Nett (1975) studied 400 accidents that occurred at two Army Materiel Command installations. Nett's study is interesting in that he used six different methods for calculating critical days. He then compared the number of accidents occurring at each of the two AMC installations on seven types of days (critical on any cycle; critical on a given cycle; multiple critical days) with that expected by chance. This resulted in 42 different tests of biorhythm theory for each facility. Only for one such facility did any of the 42 tests reach the 5 percent level of significance, indicating that such an event should occur by chance only once in twenty times. However, since it will be recalled that there were 42 separate tests, the occurrence of an event expected by chance one in twenty times offers no support for biorhythm theory.

Weaver (1974) studied 25 percent of the Army aviation accidents

involving pilot error that occurred over a two-and-a-half-year period starting in 1971. He claimed that 49 percent of these accidents occurred on critical days. Unfortunately, this study is an example of the assertion-only type, and Weaver did not even report how many accidents were included. More adequately described studies of aircraft accident occurrences have failed to find any biorhythmic effects. Wolcott, McMeekin, Burgin, and Yanovitch (1975, 1977a, 1977b) have examined a total of 9,505 aircraft accidents, both civilian and military, and have found no biorhythm effects. Khalil and Kurucz (1977) found no biorhythm effects in their sample of 63 general aviation accidents.

Turning from aircraft to other types of accidents, Khalil and Kurucz also looked for biorhythm effects on automobile accidents. There were no such effects in a sample of 181 accidents where the driver was at fault. In perhaps the most elegant study of biorhythms to date, Shaffer, Schmidt, Zlotowitz, and Fisher (1978) examined 205 highway accidents and found no hint of any effects of biorhythm. This study is a model for the careful statistical evaluation of the biorhythm theory. Carvey and Nibler (1977) investigated 150 "work-related" vehicular accidents. No biorhythm effects were found. Brownley and Sandler (1977) examined 506 fatal driving accidents. No biorhythm effects were found.

Several studies have investigated the alleged effects of biorhythms by examining industrial accidents. Lyon, Dyer, and Gary (1978) found no such effects in a sample of 112 accidents occurring at the Oak Ridge National Laboratory. A subsample of 67 accidents where the victim was obviously at fault also revealed no biorhythm effects. Persinger, Cooke, and Janes (1978) found no biorhythm effect on 400 coal mine accidents. Carvey and Nibler likewise found no biorhythm effect in a sample of 210 on-the-job accidents for which workmen's compensation was requested. Thus, over 25,000 accidents have been examined with no sign of biorhythm effects being found.

Sports Performance. Some investigators have looked at the possibility that biorhythms have an effect on variables other than accident occurrences. One of the areas where biorhythm is used widely is sports performance. As with studies of accident occurrences, studies of biorhythm effects on sports performance have failed to demonstrate such effects. Khalil and Kurucz (1977) failed to find biorhythm effects on the performance of the University of Florida swim team or the faculty-student bowling team. Louis (1978) found no biorhythm effects on the occurrence of 100 no-hit baseball games between 1934 and 1975. Fix (1976) found no biorhythm effects on the batting performance of 70 major league baseball players during the 1975 season. There was no effect either when players were considered as a group or when each player's performance on, for

example, a down day was compared to his performance on an up day. Schonholzer, Schilling, and Muller (1972) found no biorhythm effects on the occurrence at 1,051 record sports performances. Bainbridge (1978) examined the performance of golfers, both male and female, and found no biorhythm effects in the male golfers. He did find an effect of slight significance for the female golfers. However, since this is the only report of significant biorhythm effects on sports performance out of the dozens examined, it cannot be taken too seriously.

Other Variables. Turning to studies of biorhythm effects on other variables, five papers report attempts to correlate human moods with positions on the various biorhythm curves. One obvious prediction would be that mood should be most strongly under the control of the 28-day emotional cycle, with people reporting better feelings on up days than on down days. None of these five papers report any evidence to support biorhythm theory (Dorland and Brinker, 1973; Rodgers, Sprinkle, and Lindberg, 1974; Whitton, 1977; Wright, 1977; Steer, 1978). In her 1974 doctoral dissertation, Yates studied the effects of biorhythms on performance on four paper-and-pencil psychological tests measuring mood, motor performance, and intellectual performance. Ninety-six students, both male and female, served as subjects. No biorhythm effects were found on any of the measures used.

Hersey's studies (1931, 1932, 1955) of workers' emotions and their relation to on-the-job productivity are often cited as supporting biorhythm theory. In fact, this research clearly contradicts the theory's basic assumption. Hersey asked hundreds of workers to rate their moods on an 11-point scale over long periods of time. He then examined these ratings for any cyclic fluctuations. He did find that moods do show cyclic changes. However, there were large differences both within and across individuals. In one study (Hersey, 1932) the mean length of the mood cycle was 34.6 days but varied from 21 to 65 days for different individuals. A given individual's rhythm would also change greatly over time because of various environmental factors. No support for biorhythm there!

Bailey (1978) examined the deaths of presidents of the United States for biorhythm effects. Of the 35 presidents who have died, 8 have died on single critical days and 2 on double critical days. This is not significantly different from chance ($\chi^2 = 3.32$, $df = 1$, $p > .05$).

Neil and Sink (1976) had three subjects perform a choice reaction-time task daily for 70 days. Three measures were derived from a subject's performance: reaction time, movement time, and the rate at which information was transmitted by the subject. Data from each subject for each measure were Fourier analyzed to "identify periodicities in performance." Twelve significant periodicities were found, some that were

close to either one of the biorhythm cycles or a multiple thereof. However, since the periods that were significant varied from subject to subject and from measure to measure, these data provide no support for biorhythm theory.

Two more-detailed analyses of reaction-time performance in relation to biorhythm theory have been carried out. Wolcott, Hanson, Foster, and Kay (1979) found no biorhythm effects on a choice reaction-time task.

Hines (1978) examined data from a study by Fozard, Thomas, and Waugh (1976). Data from this study consisted of reaction times and error rates in a choice reaction-time task from 111 of Fozard et al.'s male subjects. Scores for 112 of these subjects on the Ammons Quick Test (Ammons and Ammons, 1962), a short IQ test, were also available. The large number of subjects in this study permitted comparisons to be made between critical- and noncritical-day performance.

The data from Fozard et al. showed no differences in performance between up days and down days for any of the three measures (reaction time, error rate, Ammons IQ) used. Likewise, there were no effects of the number of rhythms in the up phase or down phase on any of the three measures. Only the analysis of critical versus noncritical days showed a single significant difference. Reaction times on emotionally critical days were slower than on emotionally noncritical days (450 msec. versus 396 msec.; $t(109) = 2.76, p < .01$). This represents the only significant difference out of a total of 21 differences examined. It thus offers no support for biorhythm theory, being due rather to the fact that if enough differences are examined, even from a set of random data, some will be "significant" by chance alone.

Hines also examined data from a study of aging by Hines and Posner (1976), which consisted of scores on three subscales of the Wechsler Adult Intelligence Scale (WAIS), a standard adult IQ test. Scores for a total of 65 subjects, 40 females and 25 males, were examined. The three subscales used were Digit Span, Block Design, and Vocabulary. Because of the relatively small number of subjects, comparisons of performance on critical and noncritical days could not be made—too few subjects were tested on critical days for meaningful results. Analysis of the data from Hines and Posner showed no differences in performance between up days and down days on any of the three subscales for any of the three biorhythms. A further comparison examined the effects of the total number of rhythms in the up or the down phase on the day the subjects were tested. On a given day a person can be in one of four conditions, depending on the phases of his or her three biorhythms. All three rhythms can be up, two can be up and one down, one can be up and two down, or all three can be down. Biorhythm theory predicts that as the number of rhythms in the down

phase increase, performance should decrease. No such trend was found for any of the three WAIS subscales used.

Finally, Bainbridge (1978) has looked for biorhythm influences on several miscellaneous variables. He found none. Specifically, he found no effects of either the physical or the emotional cycle on the day of death for 274 baseball pitchers. Nor were there any such effects on the days on which 565 mothers gave birth or on the sex of their infants. The intellectual cycle had no effect on test performance of two samples of students from Bainbridge's classes, one sample of 105 students and one of 150. Khalil and Kurucz also found no biorhythm effect on a sample of 105 miscellaneous deaths.

The conclusion of the numerous well-done studies that have examined the validity of biorhythm theory is clear—there is no evidence to support the theory. This should not be surprising, since, although there are many well-documented biological rhythms (not biorhythms) in both humans and animals (Bunning, 1973; Saunders, 1977), none are of the fixed, mechanical, and unchangeable type that the three biorhythm cycles are supposed to be. Even the menstrual cycle, the best known of the human cycles, is highly variable both within a given woman and across different women (Matsumoto, Nogami, and Ohkuri, 1962). Further, this cycle has almost no effect on cognitive and motor performance (Sommer, 1973).

References

Ammons, R., and C. Ammons 1962. "The Quick Test (QT): Provisional Manual." *Psychological Reports* 11: 111-161.

Anderson, R. 1973. "Biorhythm—Man's Timing Mechanism." *American Society of Safety Engineers Journal* 18 (2): 17-21.

Bailey, K. 1978. "Biological Time and Political Behavior." Paper presented at the Annual Meeting of the American Political Science Association, New York, September.

Bainbridge, W. 1978. "Biorhythms: Evaluating a Pseudoscience." *Skeptical Inquirer* 2 (2): 40-56.

Brownley, M., and C. Sandler 1977. "Biorhythm—An Accident Prevention Aid?" In A. Neal and R. Palasek, eds., *Proceedings of the Human Factors Society 21st Annual Meeting*. Santa Monica, Calif.: Human Factors Society, pp. 188-192.

Bunning, E. 1973. *The Psychological Clock*, rev. 3rd ed. London: English Universities Press.

Carvey, D., and R. Nibler 1977. "Biorhythmic Cycles and the Incidence of Industrial Accidents." *Personnel Psychology* 30: 447-454.

Dorland, J., and N. Brinker 1973. "Fluctuations in Human Mood (A Preliminary Study)." *Journal of Interdisciplinary Cycle Research* 4: 25-29.

Fix, A. 1976. "Biorhythms and Sports Performance." *Zetetic* 1 (1): 52-57.

Fozard, J., J. Thomas, and N. Waugh 1976. "Effects of Age and Frequency of Stimulus Repetitions on Two-Choice Reaction Time." *Journal of Gerontology* 31: 556-563.

Gardner, M. 1966. "Mathematical Games." *Scientific American* 215 (1): 108-112.

Hersey, R. 1931. "Emotional Cycles in Man." *Journal of Mental Science* 77: 151-169.

____ 1932. *Workers' Emotions in Shop and Home*. Philadelphia: University of Pennsylvania Press.

____ 1955. *Zest for Work*. New York: Harper & Bros.

Hines, T. 1978. "Lack of Biorhythmic Effects on Three WAIS Subscales, the Ammons IQ Test, and Reaction Time and Error Rate in a Choice Reaction Time Task." Submitted for publication.

Hines, T. and M. Posner 1976. "Slow But Sure: A Chronometric Analysis of the Process of Aging." Paper presented at the Annual Meeting of the American Psychological Association, Washington, D.C., September.

Katz, S. 1977. "Biorhythm: Guide to Life or Fad for 'Numerical Nuts'?" *Toronto Star*, April 2, p. A3.

Khalil, T., and C. Kurucz 1977. "The Influence of Biorhythm on Accident Occurrence and Performance." *Ergonomics* 20: 389-398.

Knowles, L., and R. Jones 1974. "Police Altercations and the Ups and Downs of Life Cycles." *Police Chief* (Nov.): 51-54.

Louis, A. 1978. "Should You Buy Biorhythms?" *Psychology Today* 11 (11): 93-96.

Lyon, W., F. Dyer, and D. Gary 1978. "Biorhythm: Imitation of Science." *Chemistry* 51 (3): 5-7.

Mason, K. 1971. *An Investigation of the Biorhythm Theory*. Vancouver, British Columbia: Workers' Compensation Board.

Matsumoto, S., Y. Nogami, and S. Ohkuri 1962. "Statistical Studies on Menstruation: A Criticism of the Definition of Normal Menstruation." *Gumma Journal of Medical Science* 11: 294-318.

Neil, D., and F. Sink 1976. "Laboratory Investigation of 'Biorhythms.'" *Aviation, Space, and Environmental Medicine* 47: 425-429.

Nett, D. 1975. *A Study of the Relationship of Biorhythms to Accidents at Two AMC Installations*. Texarkana, Texas: Army Materiel Command (NTIS #AD-A009 319).

Persinger, M., W. Cooke, and J. Janes 1978. "No Evidence for Relationships Between Biorhythms and Industrial Accidents." *Perceptual and Motor Skills* 46: 423-426.

Pittner, E., and P. Owens 1975. "Chance or Destiny? A Review and Test of the Biorhythm Theory." *Professional Safety* (April): 42-46.

Rodgers, C., R. Sprinkle, and F. Lindberg 1974. "Biorhythms: Three Tests of the Predictive Validity of the 'Critical Days' Hypothesis." *International Journal of Chronology* 2: 247-252.

Sacher, D. 1974. *Influence of Biorhythmic Criticality on Aircraft Mishaps*. Monterey, Calif.: Naval Postgraduate School (NTIS #AD-783 817).

Saunders, D. 1977. *An Introduction to Biological Rhythms*. New York: Halsted Press.

Schonholzer, G., G. Schilling, and H. Muller 1972. "Biorhythmik." *Schweizerische Zeitschrift fur Sportmedizin* 20: 7-27.

Shaffer, U., C. Schmidt, H. Zlotowitz, and R. Fisher 1978. "Biorhythms and Highway Crashes." *Archives of General Psychiatry* 35: 41-46.

Sommer, B. 1973. "Effect of Menstruation on Cognitive and Perceptual-Motor Behavior: A Review." *Psychosomatic Medicine* 35: 515-534.

Steer, R. 1978. "Moods and Biorhythms of Heroin Addicts." *Psychological Reports* 43: 829-830.

Weaver, C. 1974. "Biorhythms: The Question of Ups and Downs." *U.S. Army Aviation Digest* (January): 13-17.

Whitton, J. 1977. "An Empirical Study of Biorhythm in Humans." *New Horizons* 2 (3): 32-35.

Williamson, T. 1975. "Cancel Today and Save Tomorrow!" *Airscoop* (March): 18-20.

Wolcott, J., C. Hanson, W. Foster, and T. Kay 1979. "Correlation of Choice Reaction Time Performance with Biorhythmic Criticality and Cycle Phase." *Aviation, Space, and Environmental Medicine* 50: 34-39.

Wolcott, J., R. McMeekin, R. Burgin, and R. Yanowitch 1975. "Biorhythms—Are They a Waste of Time?" *TAC Attack* (November): 4-9.

____ 1977a. "Correlation of Aircraft Accidents with Biorhythmic Criticality and Cycle Phase in U.S. Air Force, U.S. Army, and Civil Aviation Pilots." *Aviation, Space, and Environmental Medicine* 48: 976-983.

____ 1977b. "Correlation of General Aviation Accidents with the Biorhythm Theory." *Human Factors* 19: 283-293.

Wright, M. 1977. "Biorhythm: Fact or Fancy." In A. Neal and R. Palasek, eds., *Proceedings of the Human Factors Society, 21st Annual Meeting*. Santa Monica, Calif.: Human Factors Society, pp. 193-196.

Yates, M. 1974. *Study of Biorhythms with Students in Four Fraternities and Four Sororities at the University of Wyoming*. Unpublished doctoral dissertation, University of Wyoming (Xerox University Microfilms #75-244). •

Knowledge from the subconscious

It is a very common event for a dream to give evidence of knowledge and memories which the waking subject is unaware of possessing. One of my patients dreamt . . . that he ordered a "Kontuszowka" while he was in a café. After telling me this, he asked me what a "Kontuszowka" was, as if he had never heard the name. I was able to tell him in reply that it was a Polish liqueur, and that he could not have invented the name as it had long been familiar to me from advertisements on the billboards. At first he would not believe me; but some days later, after making his dream come true in a café, he noticed the name on a billboard at a street corner which he must have gone past at least twice a day for several months.

—Freud, *The Interpretation of Dreams*

"Cold Reading" Revisited

James Randi

Two years ago in the pages of this journal (Spring/Summer 1977), Ray Hyman gave a quite definitive account of the art of "cold reading" as practiced by those with psychic pretensions. Dr. Hyman, as a psychologist and an advanced student of "mentalist" techniques, outlined the often surprising subtleties that are employed to convince the unwary that marvelous forces are at work. More recently (Fall 1978) Ronald A. Schwartz showed how stage performer Peter Hurkos applied some of the same techniques.

Recently Dr. Paul Kurtz and I were invited to appear on Canadian TV with one Geraldine Smith, a renowned "psychic" in Toronto. She had been extensively and convincingly written up in the Canadian papers as a powerful worker, and we were looking forward to being astonished. I had brought along an object that I thought would have strong "vibrations" for a genuine psychic, and the host of "Point Blank," Warner Troyer, had an article of his own to try for results.

We reproduce here the text of Miss Smith's "reading" for each article and suggest that students of cold reading note carefully the techniques used. The end result is hardly convincing, but that is due to the fact that the owner of each object was careful not to provide any feedback to Smith at any time. The words are transcribed directly from a tape recording provided by the people at Global TV in Toronto. We thank them for their courtesy.

The host decided to try a silver chain bracelet.

James Randi is a professional magician, a member of the executive Committee of CSICP, and a well-known investigator of "psychics."

Host: Tell me something about the owner of that [handing her a "Medic Alert" bracelet].

Smith: Okay.

Host: A little bracelet. Other than the fact that they need a Medic Alert bracelet.

Smith: [laughs] Okay. First of all I'm getting a very strong gold. Now one thing I should let everybody know is, I also work with what is called "auras," and I've tuned myself into picking up vibrations, colors, from the article that the person has worn—had for some time. Now, first color is gold, and that is an extremely sensitive color. It's also, of course, allergy color too. It's the color of super, super, super nervousness. This person I'm feeling physically, upper, lower back area problems. I'm also seeing some upper stomach area things going on. Do you know this person?

Host: Uh-huh.

Smith: Personally?

Host: Uh-huh.

Smith: All right, there's something in this area here [points to chest]. You see, as soon as I pick up an article, I will physically feel different areas that perhaps have been affected by the person. Feeling this area [indicates chest], feeling this area [indicates forehead], headaches, eyestrain, something like that. Upper and lower back areas. It's also the intuitive color. I would also, I'd have to say that the person who owns it is extremely intuitive, probably clairsentient, which is very clear on the gut-feeling type areas. I'm seeing—there's a separation around this person. Are they in this area now? Because I see them, like, not here.

Host: Physically not here?

Smith: Physically not here. No.

Host: Uh-huh. Well!

Smith: Which—which would make me wonder if the person is [laughs] either dead or if there's been some very, very bad health problems with them, because I'm just *really* feeling sluggish myself. Interesting. I'm seeing the month of January here—which is now—but there would have to be something strong with the person with January as well.

Host: Okay. What color is *my* aura?

Smith: You've got blue, you've got gold, you've got green.

Host: What do those things *mean*? What's an aura?

Smith: An aura is—I perceive it as a color. A color energy vibration that surrounds the person's body. It tells me mental, physical, spiritual—ah—general personality. Green is the color of the communicator. Anybody in the communications area has to have green in their aura. In other words, in any area.

Host: So you can tell me that without looking, huh?

Smith: Yeah. In other words, yeah. In other words, you've got to have good communication in all areas. The one thing I would emphasize very strongly right now is that the green is a little bit blocked in the mental area of your aura, so that means you have been very frustrated in the area of communication on a personal level. It's almost as if you've been talking to the wall. I'm seeing a lot of [laughs], a lot of vibration there. And it's more in a personal area rather than in—you know—a work, business situation.

Host: Okay.

The host, who had been very careful not to tip his hand, following my admonitions to that effect before the program, was the owner of that Medic Alert bracelet. He had not tried to conceal the fact, though he picked it up from a small table to hand it to the psychic. She assumed that it belonged to another person and gave her "reading" with that assumption. Note that she did not tell us the age, sex, or relationship of this mythical person. She tried to "pump" the host by asking whether he knew the person and whether the person was physically there or not. Warner carefully gave answers. Yes, he knew the person. And he answered her question about the whereabouts with another question. I'm proud of him.

Jumping the gun, she guessed the person was absent, and then covered all bases with a classic generalization/cop-out—"...which would make me wonder if the person is either dead or if there's been some very, very bad health problems." Note that she was only "made to wonder," not *know*, and as phrased, it was also a question that might prompt an answer but failed to do so.

The host was neither dead nor absent. His back, he assured her, was excellent, nothing was wrong in the chest area, and when she tried to add a neck/upper-shoulder area quickly to the reading as he revealed his good state of health, he denied that as well. But she mumbled an encouraging "excellent ... fine" as he outlined his condition to cover the fact that she was dead wrong. He is neither nervous nor allergic and has no stomach problems. Headaches and eyestrain, he assured us, do not bother him either.

But I must report that our host tumbled for one of the more common tricks of such readings. You see, the victim is allowed and encouraged to read more into the recitation than is already there. Smith had said, "I'm seeing the month of January here," and during his denial of the accuracy of her reading, he admitted that she had determined that his birthday was in January! But she had said nothing about a birthday, particularly *his* birthday, since she didn't even know the bracelet belonged to him! When confronted with all this evidence, Ms. Smith explained: "The thing is, that,

to me, in a reading, means quick removal from a situation, which means either leaving this place, leaving the country—quick removal." Perhaps the lady was expressing her own desires of the moment. It certainly didn't make any sense to me.

Looking at Paul Kurtz and myself, she tried another tack. "Understand, I can totally see what the two of you are saying. The thing that I take a little bit further down the line is—my readings—as much as many things can be applied to many people, aren't there a lot of similarities in life? [There was a short stunned pause here, as we all tried to think what she could possibly be trying to say.] You know, we get married or we don't, we're male or we're female, we have children or we don't."

Ms. Smith was a little bit subdued, but smiled bravely after this confrontation. She was yet to be tested with an object that I had brought along specifically for the purpose. It was an object that I had a complete history of, and it was something I had owned for some time. In terms of a psychometry reading, it should have been excellent material. I will reverse the regular procedure in that I will tell you in advance all about the object, and then give you her entire word-for-word "reading" of it. You will then be in the position I was and be able to do your own analysis of her accuracy.

The object was a small bisque-fired ceramic, black in color, of Peruvian origin. It measured seven inches long and was in the form of a bird, with a spout coming from the top. It was a fake—a replica—of a genuine Mochica grave object and had been made by a friend in Lima who is Peruvian by birth but Chinese in ancestry. He is a short man, five-foot-seven or so, heavy, straight black hair, 28 years of age, with totally Chinese features to all appearances. He is single, or was at the time the reading was made. He speaks only Spanish. His business is making accurate replicas of original Peruvian art and repairing ceramics. The ceramic was given to me by him because it had been broken, and I repaired it myself when I returned to the United States. I have a large collection of similar peices, both genuine originals and good replicas. I had brought this one with me to avoid breaking a valuable original, and to get around the tendency of psychics to expound on nonexistent people long extinct, who they can safely claim were associated with such an article. I knew the whole history of the object, from molding to breaking and beyond.

Geraldine Smith took a deep breath and started on her "reading" of this article, while I carefully sat there unblinkingly.

> Smith: Okay. The first thing that—actually I'm very quickly being taken over maps, and I'm tuning in very strongly to Mexico, United States—general area there. I'm seeing three *very* strong personalities, two females

and a male, and I'll describe them all for you. First of all, the man I'm seeing is approximately five-foot-eight, five-foot-nine. To me, that's short for a male. Very deep brown hair, but receding at the temples. Glasses, quite thick. Obviously very bad eyes, because the focus I'm seeing is very, very strong. I'm seeing kind of a round-neck shirt. It's not the type you have on now. I guess it would be more along the line that he is wearing [she pointed at two of us]. Then I'm going to the two ladies. Oh, I didn't give you an age on the man. He would have to be 45 to 50. Something like that. The ladies I'm seeing, one would be, hmmm, five-foot. Very short. Four-nine, five-foot. The other lady is quite a bit taller. One is very, very, very heavy-set, and shortish curlyish hair, but fluffy. And the other one, the shorter one, is just, well, there's nothing really big about her. I'm seeing these three people very much in connection with this. Do you recognize them at all?

Randi: Now you're asking me something. You're supposed to be *telling* me.

Smith: I mean, *do* you recognize them?

Randi: Do you want now the history of the object? Is the reading finished?

Some things about this exchange will be obvious. She took a guess at an Indian origin, but missed. It could have been North American Indian or Mexican to the uninitiated, but it was not. She threw in three people for a try-on, and I'm still trying to fit in the two women, but I can't. The man's eyesight is excellent—he does not wear glasses. As for height, she's great on that, and the fellow does wear turtleneck sweaters frequently. His hair is very definitely *not* receding—quite the contrary. The age she gave is at least 17 years off.

Now, you should know two other things about this test. First, I told Geraldine Smith very clearly that this was not to be considered a formal test. My reasons should be obvious. It was quite possible for her to have looked into my background and discovered my interest in Peruvian archaeology. She could have visited a museum and come up with the origin of the object easily. Second, she agreed to consider a formal test by the CSICP, to be conducted regardless of the outcome of this demonstration. We have not heard from her since that time. •

Correction

The pinhole-projector photo labeled "Bath Cathedral" in the Spring 1979 issue (p. 46) is actually of the Royal Albert Hall. No paranormal or magician's trickery, just the editor's mislabeling.

The Teacher, the Student, and Reports of the Paranormal

Elmer Kral

A teacher cannot escape the fact that students are curious about reports of the paranormal and that the subject is occasionally brought up in class, in literature, and in the media.

Consider the following facts selected from a wide range of data: In the spring of 1977, NBC-TV scheduled in prime time in just one week five movies and one documentary on paranormal subjects from a predominantly pro-believer side of the controversy.

That same year, a book purporting to be a true story about a haunted house on Long Island became one of the biggest publishing successes of the year.

In 1978, *Teacher* magazine published an article in which a teacher advocated grouping students for classroom work according to their astrology signs.

A survey conducted by George Gallup revealed one out of two adult Americans polled believes in flying saucers and extrasensory perception.

What a teacher should do about all of this is the question.

One option is to refuse to discuss or acknowledge the possibility that such paranormal phenomena exist. Another option is to tell the students that many reputable scientists are not impressed by the interpretations of the evidence advanced for claims of the paranormal. Still another option is to decide that study of the paranormal is best done by reliable professionals and scientists.

Or one might decide, as I have, that a teacher has an obligation to insist on good scholarship and rigorous critical examination of the subject—whenever students express interest in it.

Here is what I have done and how.

Elmer Kral is an instructor of English at the Senior High School, Grand Island, Nebraska, and co-chairman of the CSICP's new Education Subcommittee.

Eyewitness Testimony and the Human Being

Some of our important literary works, such as Shakespeare's *Hamlet*, openly referred to "ghosts" and other reported paranormal phenomena.

Instead of dismissing such beliefs as faulty habits of thinking, I use them to help my students discover the limitations of eyewitness testimony and the dangers of rash acceptance of facts and interpretations of facts, necessary learnings that can be transferred to other fields of knowledge as well as to their everyday lives.

I do this by inquiry and by avoiding methods that appeal to authority and cherished prejudices. For example, after students ask about the "ghost" in *Hamlet*, I provide no answers. Instead, I show slides of the Elsinore castle area, the location of the ghost report in the play, and ask them to review the facts of the viewing situation and the report. Also included in the slide presentation are pictures of objects and shapes, so the students may discover firsthand their own perceptual abilities and limitations.

We then refer to findings of reliable researchers by reading Robert Buckhout's "Eyewitness Testimony," *Scientific American*, December 1974. I ask the students to verify the findings by recalling personal experiences in perception of behavior of friends, by relating accounts in the media, and by inventing simple experiments.

I also ask them to analyze how even trained observers, such as pilots, military personnel, law enforcement persons, and scientists are also subject to errors of perception.

For students who want to go more deeply into such matters, I recommend they interview a visiting psychologist and suggest they read the chapters on "Witch Mania" and "Haunted Houses" in Charles Mackay's *Memoirs of Extraordinary Popular Delusions* (1852), available now in reprint.

Students also have the freedom to pursue the subject in a short paper on *Hamlet*—on the condition that they integrate information from such fields of knowledge as logic, psychology, sociology, and the physical sciences.

One final comment on our study of the ghost in *Hamlet*: I avoid discussion of religious beliefs and concentrate, instead, on understanding the limitations of human senses.

Evidence and the Scientific Method

An inevitable consequence of assigning research papers in the twelfth grade is a request to do something on a current pseudoscience about such

things as pyramid power, flying saucers, or biorhythms.

Basically, I feel teachers ought to encourage students to search for the truth rather than to maintain points of view. So I allow students to study a pseudoscientific theory if they agree to evaluate the evidence, use the scientific method, conduct a small experiment, and consult teachers and available professionals who have technical knowledge.

Last spring, I allowed a student to do a study on biorhythms because I had the cooperation of my local psychology and chemistry teachers and the assistance of Dr. A. James Fix. He is an associate professor of medical anthropology at the University of Nebraska Medical Center and author of a small study on biorhythms and baseball players.

The student defined her terms and designed a means of measurement, while guarding against the "self-fulfilling prophecy" and the "Hawthorne effect," read papers from the opposing point of view, and followed a model of a ten-page paper written for a college course in educational psychology.

Her findings were that the so-called "critical days" had no effect on the school attendance of 39 high school seniors during the previous six months.

Belief, Bias, and the Dissemination of Information

Reputable scientists and other professionals have not been able to bring demonstrations of claims of the paranormal under experimental control to the satisfaction of all scientists, nor are they able to formulate quantitative theories that will explain the phenomena described.

Yet belief continues in the reports of something paranormal, which includes, but is not limited to, such terms as precognition, telepathy, clairvoyance, psychokinesis, psychic predictions, astral projection, astrology, and memories of past lives.

For those theories in which self-deception plays a major part, I recommend preventative measures, such as those Joseph Jastrow recommended in 1900 in his book *Fact and Fable in Psychology*, now available as a reprint.

To help students develop sound habits of thought, I have them study the fixation of belief. This is done when we study Thomas Hardy's novel *The Mayor of Casterbridge*, whose main character ruins his life because of poor problem solving. Information from Gustav Jahoda's *The Psychology of Superstition* (1969) helps students identify the Mayor's basic beliefs, and we apply our knowledge of logic from Ward Fearnside and William Holther's *Fallacy, the Counterfeit of Argument* (1959). I also integrate into the discussion current references to problems in research, such as those described in "Laetrile at Sloan-Kettering: A Question of Ambiguity" in

Stand on your head for science

March 21, 1979, was an exciting day in my life. The *Grand Island Daily Independent* had my picture and a large write-up about the performance I had given the previous day at the Senior High School in Grand Island, Nebraska. The article was entitled "Senior High lecturer debunks psychic claims."

I had been invited there by Elmer Kral, English teacher and co-chairman of the Education Subcommittee of CSICP. It was exhilarating meeting with him and communicating with his students. At the conclusion of our visit, Elmer invited me to join the Education Subcommittee of the CSICP. I was quite pleased at this and accepted.

First thing on the morning of the twenty-first, I was a guest on KMMJ-Radio, Grand Island, on Ray Gearhart's "On the Air" show. The topic was psychic phenomena. The show, including the calls from the listeners, went quite well.

Toward late morning, the touch of a sore throat I had got worse. The following day it was so bad that I made an appointment with a doctor. Driving home, I was apparently inattentive and was stopped for speeding and was given a summons.

When I arrived home, although fatigued, I still managed to do some creative writing. In the evening, I telephoned a woman who—. The details are not important (to this story). Let's just say I concluded the conversation on a romantic high.

The continued sore throat and now a headache were pressing on, so I plopped into bed. Before retiring, I scanned the newspaper.

Lo! There's my personal biorhythm! And so, with pen in hand, I filled in the little boxes to compute my figures, and then referred to my chart for the day:

Physical:	HIGH	*Wrong!*
Emotional:	LOW	*Wrong!*
Intellectual:	LOW	*Wrong!*

As I had learned from other mystical disciplines, if things don't work out, slight adjustments or shifts or redefinitions may be required. After all, we can't abandon the basic science.

Aha! There it is! If I simply stand on my head, my biorhythm chart will be perfect! See that, there really is something to this science!

—Robert A. Steiner

Robert Steiner is a certified public accountant and magician in Lincoln, Nebraska.

Science, December 23, 1977, and in "Statistical Problems in ESP Research" in the July 14, 1978, *Science*.

For one must always ask, "How is it possible that authorities in any field may be cautious and logical in their special area but then—in and out of their area—suddenly succumb to a personal bias, become uncritical, and accept faulty argument?"

To help the students appreciate the value of objective scientific evidence, I ask a mathematics teacher to show how statistical odds are figured and to demonstrate probability through use of the coin toss.

To help them recognize the conditions under which human testimony may be unreliable, I ask students to read Milbourne Christopher's *ESP, Seers and Psychics* (1970), which offers some simple tests that anyone can use to determine the validity of such things as Ouija boards, astrology, and astral projection.

To help students learn the evils of contagion—e.g., that being part of a group can lower one's critical ability, power of observation, and rationality—I use Walter Van Tilburg Clark's *The Ox-Bow Incident* (1940), a western novel that demonstrates the way beliefs can spread.

It is also important to set an example in providing balance in the presentation of opposing views. For example, in my weeklong minicourse "Science, the Human Being, and the Paranormal," I invite two science professors with opposite views, a State Patrol polygraph operator, and the viewing of two PBS "Nova" programs: "The Case of the Bermuda Triangle" and "In Search of Ancient Astronauts." For current information, I recommend both the *Journal of the American Society for Psychical Research* and the SKEPTICAL INQUIRER.

In summary, then, teachers can provide an education that may serve as a preventative for gullible acceptance of reports of the paranormal. They can do it by asking their students to separate fact from interpretation, evaluate statements and sources, investigate arguments both pro and con, distinguish between belief and truth, develop criteria of acceptable evidence and of proof, and value the scientific method.

In addition, students should be assured that, if at any time any of these reports contain something really new, it will be reported and examined by worthy scientists and professionals; for science is a self-corrective system that can adopt any theory when there is evidence to support it. •

An Encounter with the World's Greatest Sorcerer

John Sack

Do sorcerers fly? Yes, indeed, says Carlos Castaneda: "His body shivered. The tail of his costume vibrated and he took off. He went over the trees towards the south, and I heard him say, Why don't you come and fly with me? I felt I wanted to—"

Me, I don't know about that. I met the world's greatest sorcerer (so nominated at CIPAR, the Colombian Institute of Parapsychology) at eight thousand feet in the Andes in the holy Indian village of Ceucumque, Colombia, in September 1975. His name was Juancho, and I think I've shown great restraint in not calling him Don Juancho. He seemed as old as the mountains around us—his face was a mummy's face, and his gray beard was as venerable as Ho Chi Minh's. At his orders, we shuttered up his white windows, and in the darkness we lit a kerosene lantern that we had cleaned in the kitchen's stone sink and had trimmed with a razor blade ripped from the cartridge of my Gillette Trac II. It was five o'clock—the sundown hour—and the afternoon rain was a hundred voodoo drums on the galvanized steel roof. The sorcerer sat on a cot in the bedroom saying, in Aruac, "All right, what do you want me to do?"

"I have a girl friend in Hollywood," I answered. "I want you to fly there to see how she is."

"All right," the old sorcerer said. "I'll need a teacup, first—" I fetched him a teacup from the pitch-black kitchen. "A teacup that's full of water, please—" I stumbled into the blackness again to put water in. "A couple of fresh lemons—" I ran through the drenching rain to buy some lemons nearby. "A bottle of Aguardiente liquor—"

John Sack is an author and contributing editor of Playboy, *whose next book will be published by Random House. This is a selection from it.*

"Aguardiente? There isn't any," I said.

"I'll need the Aguardiente," the sorcerer said.

Despair! I was beside myself until my interpreter said, "Well, I have some antiseptic alcohol."

"Aguardiente's better. But alcohol will do. And," the sorcerer said, at last completing his difficult requisition list, "a photograph of the girl friend in Hollywood."

"I have it," I told him. Quigley, my far-away friend, was a movie actress (she was the first kumquat girl in *W. C. Fields and Me*) and zippered into my backpack was a much-loved copy of Quigley's composite. On it Quigley was buying orange juice at a supermarket, smiling. On the other side she was dressed like a sorcerer in a heavy white robe but was kicking at the cameraman's camera, and in bafflement the sorcerer stared at it.

"What is she doing here?"

"She is doing karate, sir."

"A sport?"

"She is doing a sport, sir."

The sorcerer set the composite aside. He dipped his fingertips in the interpreter's bottle and he scattered the antiseptic alcohol to the four compass points. He sliced one of the lemons and he squeezed the lemon juice into the water-filled teacup. He carried the kerosene lantern to the plaster mantel opposite him. And sitting down on the cot again, he took out of his *mochila* a little glass ball—a "puree" we called it at camp, playing marbles—he dipped the puree into the teacup to cleanse it and squinted at the kerosene lantern through it. The flame was a tiny pilot light in the sorcerer's circular eye—oh, this was becoming spooky, I promise you. And then, while the rain on the roof continued like a wild voodoo ritual, he floated off of the cot and passed through the roof, bound for Los Angeles.

For the life of me, I couldn't see it— I'd swear that he was still sitting there (and was *talking* to me, for crimminy's sake) but on his return in thirty minutes he would assure me that yes, indeed, he had flown to Hollywood in another body—in another reality, that is. "I see her," the sorcerer said now.

"You see her!"

"She is traveling now," the sorcerer said.

"She is traveling now! But traveling where?"

"East," the sorcerer said.

"She is traveling east!"

"She is traveling east. To the west," the sorcerer said.

"Oh, she is traveling west!"

"No, she is already west and is traveling east," the sorcerer said. "To

the west."

"I don't understand," I confessed. "Is she traveling to where the sun rises or to where the sun sets?"

For ten long minutes, the sorcerer peered at the flat tongue of flame through the small crystal ball. The only light was the yellow lantern light (in its shadows he looked like a pirate with a glass eye) and the only sound was the rain on the farmhouse roof. At last the old sorcerer asked me, "Your house in Los Angeles. Is the man still alive who built it?"

"No. It was built by a man who's dead now."

"It was built by Igor Stravinsky for Dylan Thomas," I now hoped the sorcerer would say. He would have been a hundred percent correct, for I lived in that very guest house in Hollywood. But instead the sorcerer asked me, "Do you live with a woman there?"

"No. But last year I lived with a woman there."

"A red-headed black Peruvian pop singing star," I now hoped the sorcerer would say. Her name was Robertha, and she was now starring at the Caribe Hilton in San Juan, Puerto Rico. But the sorcerer asked, "Is she dead now?"

"No. She is very alive."

"I'm not being silly," the sorcerer said. "If—"

"Oh! I don't think you're silly, sir!"

"If you ever lived with a woman who's dead it's a negative influence," the sorcerer said, "and I must erase it. Eradicate it."

I thought a few moments more. "I once lived for a week with a woman who's dead."

"She died later on?"

"Of course. She died very horribly."

"She was eaten by sharks while swimming from New York City to London," I still thought the sorcerer would say. It is the truth, dammit! The lady's name was Britt Sullivan, and her catastrophe made the front page of the *New York Times*. But the sorcerer asked me, "Did she die suddenly? Or did—"

"She died suddenly."

"Ah." And putting the puree in his *mochila* again, the sorcerer rose in our usual worldly reality. He commenced to open the shutters, saying, "The work is finished now."

"Is finished? Is finished, sir? But isn't there anything else you can see? Is my girl friend in Hollywood? Is she feeling good. Is she feeling bad? Is she getting work? Is she traveling east? Is she traveling west? Is she—"

"Aguardiente," the sorcerer howled.

In the annals of mental telepathy there are a thousand success stories that, in the absence of *unsuccess* stories, might make a true believer even of

John De Butts, the chairman of AT & T. So let these records show that at five o'clock in the Andes (or three o'clock in Hollywood) Quigley, as I'd establish, was not traveling north, east, south, or west but was catnapping up in the sleeping loft of her immobile home in Hollywood. In fairness, a few minutes later the telephone rang and Quigley woke up and rolled three feet to the east to answer it. "You have a commercial call on Monday," her agent said. "At two o'clock at Don Brown Films. Go get it."

"Thank you, George," Quigley replied. And hung up and fell asleep, rolling three feet to the west to do so. •

Drawing by Stevenson, © 1979 The New Yorker Magazine, Inc.

"Sure it was lousy, but it was better than reality."

Book Reviews

Encyclopedia of Occultism and Parapsychology. Edited by Leslie Shepard. Gale Research Co., Detroit, 1978. 1084 pp. Two volumes. $48.00/set.

Reviewed by Ray Hyman

The subtitle of this encyclopedia—"A Compendium of Information on the Occult Sciences, Magic, Demonology, Superstitions, Spiritism, Mysticism, Metaphysics, Psychical Science, and Parapsychology, with Biographical and Bibliographical Notes and Comprehensive Indexes"—indicates its ambitious range of coverage. States the editor: "The scope of the present work is a very broad one. The word 'occult' has been interpreted in its widest sense of 'hidden, secret, beyond human understanding,' as well as pertaining to magic spells, miracles, and witchcraft. Certain mysteries, such as the Loch Ness Monster, Bigfoot, and Unidentified Flying Objects have a valid inclusion, even if they may someday be identified as elusive but objective entities around which legends and mythologies have grown."

Three individuals have written the more than 4,000 entries. Approximately 3,000 entries have been taken over from the two standard works: *Encyclopedia of the Occult* by Lewis Spence (1920) and *Encyclopedia of Psychic Science* by Nandor Fodor (1934). In most instances the items have been taken over unchanged. In a few cases, Shepard has added a paragraph or a bibliography to bring some of the entries up to date. In addition, Shepard has written around 1,000 new entries, as well as provided a complete and useful general index along with nine helpful special indices on such topics as "Animals, birds, insects," "Demons," "Gods," "Paranormal Phenomena," "Societies and Organizations," and so on. The special index on "Paranormal Phenomena" is further divided into 50 subcategories, such as "Animal magnetism," "Apparitions," "Automatic writing," "Dowsing," "Extrasensory perception," "Eyeless sight," "Haunting," "Healing, psychic," "Levitation," "Mediums" (over 220 are indexed), "Multiple personality," "Poltergeist," "Psychic photography," "Slate-writing," and so on.

The handiest standard for comparison is the 24-volume set of *Man, Myth, & Magic: An Illustrated Encyclopedia of the Supernatural,* edited by Richard Cavendish (1970). The Cavendish encyclopedia has three times as many pages but many of these are covered with lavish illustrations (the Shepard volumes have no

Ray Hyman is professor of psychology at the University of Oregon.

illustrations). The Cavendish work has more entries, but the Shepard volumes have longer entries that cover special topics in greater depth. Both works have superb general and special indices.

The major difference between the two contemporary encyclopedias is in the authorship of the entries. Cavendish's work contains contributions from over 200 experts. This gives the advantage of expertise for each entry. It also results in the inevitable unevenness of such varied authorship. The majority of entries in Shepard's book have been left just as they were written by Spence in 1920 or Fodor in 1934. In many cases, this does not matter greatly because the entries refer to events or persons of the past, but some of the entries would have profited from the addition of material that has emerged since the Spence and Fodor accounts. However, because of the material that Shepard has added and the entries he has written, the *Encyclopedia of Occultism and Parapsychology* benefits from being published eight years later than the Cavendish work. In addition, the Shepard work will be kept contemporary by interedition supplements that come out four times a year (a subscription costs $30 a year).

Shepard's encyclopedia exhibits both the advantages and disadvantages of limited authorship. Both Spence and Fodor produced works of heroic proportions. The range and thoroughness of their scholarship is impressive. I am equally impressed with Shepard's attempt not only to include many of the original entries but also to provide coverage of what has taken place since 1934.

But a single individual cannot have command of the entire range of knowledge relevant to occultism and the supernatural. And this results in inevitable gaps or weaknesses in specific instances. The fact that all three authors share the same biases is both a minus and a plus. It is a minus because a specific bias creates a filter for deciding what is and is not to be included; and it colors the presentation of debatable issues. To be fair, however, I should point out that the three authors, although proponents of the genuineness of many paranormal phenomena, seem to lean over backward to present many of the skeptical arguments. And since their collective biases become readily apparent through reading the entries, the careful reader can take such biases into account when using the encyclopedia.

All three authors included in this work seem to share not only a common set of attitudes and beliefs but also rather similar backgrounds. Lewis Spence (1874-1955) was a journalist and a Scottish scholar of the occult. He was especially concerned with the problem of Atlantis, on which he wrote four books. L. Sprague de Camp described Spence's first book on Atlantis as "the best pro-Atlantis book published to date" (as of around 1950). Although less naive than Ignatius Donnelly's wild speculations, a recent expert on classical studies (E. S. Ramage) has characterized it as "full of misconceptions about chronology, geology, archaeology, and ethnography." Both in his Atlantis books and in his entries in this encyclopedia, Spence shows signs of impatience and hostility toward what he calls the "tape-measure school" of science and pushes for a more "inspirational" approach.

Nandor Fodor (1895-1964), who began as a lawyer in Hungary, became a journalist and then a psychoanalyst. Spence's *Encyclopedia of Occultism*, which came out in 1920, is more heavily oriented toward mythology and folklore than is Fodor's *Encyclopedia of Psychic Science* (1934). The latter work is much more concerned with mediums and spiritualistic phenomena. But both authors share remarkably similar beliefs about the role of fraud, self-deception, and psychological states in the production of allegedly paranormal phenomena.

Other than his contributions to the current encyclopedia, I know of Leslie Shepard only through the forewords he wrote to reprints of Baron von Reichenbach's books on the Odic force. Reichenbach, a nineteenth-century chemist and metallurgist, began in 1850 to publish works that presented his theories and results of experimentation with what he considered to be a new force. This force could only be detected by special individuals whom he termed "sensitives." These sensitives could see colored flames emerging from magnets and they could see auras emitted from individuals. The Odic force could also account for table-turning, divining, and many phenomena attributed to animal magnetism. Reichenbach's contemporaries ridiculed his claims and refused to take him seriously. But with the current pop-occultism revival of interest in mysterious forces such as radiesthesia, Kirlian auras, ley lines, and orgone energy, the Odic force has been rediscovered. Shepard is among those who feel that "it is time that Reichenbach had another hearing."

Shepard gives a clear presentation of his views toward his subject matter in his Introduction. He has taken "much care... to present occultism and parapsychology in a way that avoids the sensational presentation so often associated with such topics in modern times... Occultism and parapsychology are still highly controversial subjects and there are varying shades of opinion on all aspects, ranging from uncritical acceptance to invincible disbelief.... It has to be admitted that the occult world has been permeated by deception, fraud and folly, although this does not invalidate much that is genuine and of great cultural and scientific importance.... Social responsibility requires the avoidance of a too ready acceptance of the dubious and dishonest as much as a too hasty rejection of the bizarre and paranormal. Because of this, every effort has been made to maintain a realistic presentation that strikes a fair balance between credulity and skepticism."

How does one evaluate such a work? I tried a number of approaches. I have had a reprint of Fodor's *Encyclopedia of Psychic Science* for a number of years and have found it a very useful reference on a number of occasions (paperback reprints are available for less than $10, a very good buy). The Shepard work, containing not only most of Fodor and Spence but additions by Shepard, is even more useful because of the several indices (Fodor has no index). In the few months I have had Shepard on my bookshelf I have found it useful on a number of occasions—in preparing book reviews; in researching talks on psychics and scientists. It is useful for historical material, especially with respect to the heyday of spiritualism during the Victorian era.

I drew a random sample of 50 items to read. Most were highly informative and seemed to be written from a neutral or nonevaluative standpoint. In some cases, such as the entry on Florence Cook, the accusations of fraud are fully described, but the writer tends to dismiss them or to find ways to save the case for at least some genuine paranormal elements. On some phenomena, such as ectoplasm, psychometry, and clairaudience, the entries are written as if there is no question about their reality. The article on Nostradamus is especially credulous and, in this respect, compares unfavorably with the one in Cavendish.

I supplemented this sample with a selection of items that I felt somewhat knowledgeable about. I will briefly indicate some of my reactions. I was surprised to find no separate entry or indexing of Clever Hans. Clever Hans and his owner, Herr von Osten, are briefly alluded to in an article on the Elberfeld Horses, who were the direct successors to Hans. Shepard presents the case for these horses having either human intelligence or mediumistic powers in a credulous manner.

Surprisingly, he does not mention Pfungst's classic book on Clever Hans or his systematic investigations that produced a completely normal explanation of the phenomenon. Indeed, in my opinion, Pfungst's book is the classic debunking job of all time.

For Harry Edwards, England's famous faith healer, Shepard reports an 80 percent recovery rate for such illnesses as cancer, TB, and the like. He vaguely alludes to skepticism on the part of the medical profession but, surprisingly, does not refer to Dr. Louis Rose's important book *Faith Healing*, in which he describes working closely with Edwards and failing, after a determined effort of many years, to find one single case of valid faith healing. Kathryn Kuhlman's faith healing is also described by Shepard in a completely credulous manner with no mention of William A. Nolen's careful study of her methods and his inability to find any proof that she can produce results.

On the other hand, Shepard seems skeptical of dianetics and Scientology, cloudbursting, some claims of modern gurus, Castaneda's Don Juan, and the reality of Bridey Murphy. But such skepticism is more than offset by his positive verdicts on the reality of water witching, the Cottingley Fairies, table-turning, psychic surgery, Abram's Black Box, Ted Serios's psychic photography, Reich's orgone energy, dermo-optical perception, the Davenport brothers, Jeane Dixon, psychic plants, some of Madame Blavatsky's miracles, and the Raudive voices.

Nevertheless, I find the encyclopedia a useful reference work. Shepard, for the most part, does honor his commitment to present both sides. His biases are out in the open and easy to discount when using the material. I do find some striking omissions on the skeptical side, but I attribute these to the limitations inherent in a work for which a single individual is responsible. Some of these omissions are the following:

1. On water witching, pendulum divination, Ouija boards, and related practices, the encyclopedia presents Chevreul's and Faraday's arguments that these are the result of involuntary muscular movements. But Fodor and Shepard dismiss these arguments as inadequate to account for all the phenomena and attribute paranormal forces to many of the applications. No mention is made of the many scientific studies, all casting doubt on the reality of these phenomena, that are covered in the book by Vogt and myself (*Water Witching U.S.A.*) or of studies made since that time. Nor does Shepard make it clear that no scientific evidence has ever been accumulated for the position he takes.

2. N-rays, Abram's Box, and related ideas on mysterious radiations are presented without reference to the striking and convincing evidence against their reality (e.g., Wood's famous *Nature* paper on N-rays).

3. The Kirlian aura, acupuncture, and alleged phenomena of psychic plants are all presented in a credulous manner with no reference to many scientific studies that failed to replicate the phenomena or demystified them in terms of very normal science.

4. The entry on Raudive Voices, which concludes that "there is impressive evidence that the communications are mainly from dead individuals" fails to mention the work of Ellis, which indicates that most, if not all, of the phenomena can be attributed to artifact.

5. Arthur Ford's mediumship, and his alleged breaking of Houdini's code through spirit contact, are presented with no reference to damaging revelations in books by Spraggett and Rauscher.

Even when Shepard, or his deceased coauthors, do bring up the damaging

material, they often find excuses, sometimes very farfetched, to somehow save the day for paranormality. Here are some examples from my notes:

1. Shepard discusses Abrams and his famous Black Box. He admits that Abram's approach to diagnosis was unconventional—the patient could send a drop of blood (or even a sample of his handwriting) and this could be the basis of a diagnosis from long distance by use of the Black Box—but argues that he "was no quack." Compare this with James Harvey Young's quotation of Cramp's that Abrams "easily ranked as the dean of twentieth-century charlatans." In his entry on Black Boxes, Shepard admits that the box does not operate reliably but claims that this is because "special sensitivities were involved."

2. In the entry on psychic surgery, Shepard admits that "there is a strong possibility that some 'operations' ... have been fakes." He concludes, however, "But, as with Spiritualist and related paranormal phenomena, it is possible that the healers and a large proportion of their phenomena are genuine, but that trickery may sometimes be resorted to when natural powers fail."

3. After presenting Fodor's account of Helene Blavatsky, with its summary of the Hodgson report that concluded, "We think that she has achieved a title to permanent remembrance as one of the most accomplished and interesting imposters in history," Shepard adds some paragraphs of his own that state: "The character of this remarkable woman was too complex for instant judgments on whether she was a genuine mystic or a charlatan. In fact, she seemed to manifest genuine paranormal phenomena with the same unconcern as the most childish frauds. She had a great contempt for stupidity, and it is possible that much of her undoubted trickery was performed as a prank, to mock the credulity of foolish followers ... That she had genuine occult inspiration and powers cannot be doubted."

4. On Jeane Dixon, Shepard remarks: "Because some of her predictions have not been realized, Mrs. Dixon has been widely disparaged by some critics, who have also taken exception to what they regard as her right-wing bias. However, most sensitives have a certain failure rate, often based on faulty interpretation of symbols ... Mrs. Dixon has had an impressive rate of successful prediction of important world events." Shepard does not document this record. The attempts to tally her predictions and compare them against outcomes, at least the ones I have seen, are impressive mainly for how strikingly wrong she has been.

5. With respect to the medium Eva C, Shepard comments, "Some ambiguous or even fraudulent phenomena [have] often been mingled with genuine mediumship. Mediums in a state of trance do not have conscious control over their actions, and often respond to the desire of sitters for paranormal phenomena by ingenious frauds. Sometimes a strong expectation of fraud will result in fraud."

6. But my nomination for the "Bent-Spoon Award" goes to Shepard's ability to salvage some genuineness for Keely and his notorious motor. Ord-Hume in his book on *Perpetual Motion* opens his chapter on Keely with the following words: "Of all the perpetual motion frauds the story of John W. Keely's carefully planned deception and the manner in which the Keely Motor Company defrauded people of large sums of money rank supreme. As a perpetual motionist, it is difficult to imagine that he ever set out with honourable intent." Apparently such a feat of imagination is not beyond Shepard's abilities. Shepard reports: "After Keely's death ... startling evidence of fraud was uncovered, and it has since been assumed that all his inventions were fraudulent. The real motive force seems to have been compressed air, concealed in cylinders in a secret basement and conveyed to the

apparatus by thin hollow wires. Nonetheless, many individuals even today believe that any fraud may have been merely because of the intense pressure to show practical results, and that there may have been some genuine basis to Keely's life work."

This is just a small sampling of many of the defenses of the reality of paranormal phenomena put forth by Spence, Fodor, and Shepard. Such defenses will surely tend to raise the hackles of many of the readers of this journal. But, if such readers can make the proper emotional and intellectual adjustments for these biases, I think they can profit in many ways from careful use of this reference work. As I have indicated, the biases are out in the open. They typically show up when the authors are trying to cope with accusations of fraud, error, or mistaken judgments. To the credit of the authors, they do, for the most part, try to acknowledge the arguments of skeptics. In most of these cases the skeptical reader is alerted to counterarguments and can make his or her own conclusions.

For me, the most valuable benefit of browsing through this encyclopedia was the opportunity to gain insights into the mentality of a type of believer who falls into error because of good intentions. Spence, Fodor, and Shepard represent the type of believer that, in my opinion, we skeptics should take quite seriously and try to understand. These men are not fanatics, cranks, or crackpots. Unlike the more extreme supporters of the occult, such as Arthur Conan Doyle, Alfred Russel Wallace, and the like, they pay careful attention to the critics and accept many of the charges of fraud or error as true.

In their own way, Shepard and his coauthors are trying their best to be scholarly, fair, and balanced. In many ways they are more open-minded and impartial than some of the skeptics and critics. But it is just this commitment to balance and fair play that, in my opinion, traps them into false beliefs. I find it somewhat touching and appealing that these men are so willing to try to accommodate all sides.

The problem comes from trying to balance testimonies from two sides as if they were equal in trustworthiness. In treating all parties fairly, they easily err in giving credence to testimonials that have no place in the court of science. Spence's entry on "Evidence" reflects this tendency. He complains, "The whole history of science and discovery is a triumph of true testimony, yet it is a strange fact that very little thought is generally given by the very representatives of science to the enormous amount of testimony and experimental observation that has been piled up by spiritualists and psychical researchers in the last eighty years."

Spence wrote that entry in 1920. The sort of "testimony and experimental observation" that he was talking about was just the kind that is useless for scientific purposes—it depended upon unsystematic accounts, untrained and unaided observations, nonstandardized tasks, and phenomena that were generally unrepeatable and inaccessible to skeptical eyes. Shepard seems to sense that adherence to the ground rules of science might never allow paranormal claims to become accepted. In his article on parapsychology he concludes: "It is this separation of parapsychology from life which makes laboratory experiments tedious, lacking in warmth or incentive, whereas the uncritical believer, whether Spiritualist, Christian Scientist or member of a witchcraft or Voodoo cult may generate a powerful emotional drive which produces sensational phenomena or exalted states of consciousness. It may eventually become necessary for certain areas of parapsychology to sacrifice some of their objectivity and discover a philosophical or religious basis for the validation of the paranormal as a functional

part of everyday life, as it was in primitive societies."

The dilemma for Spence, Fodor, and Shepard is how to make sense out of the conflicting testimonies of believers and skeptics without impugning the integrity of any of the witnesses. The irresolution is more creative than the simple decision that one of the sides must be wrong. They assume that there must be truth on both sides. Shepard accepts the testimonies of those who claim to have seen Tony Agpaoa faking his "operations." But he also accepts the testimonies of those who claim they saw Tony perform his psychic surgery under conditions that precluded trickery. Fodor apparently accepts some of the testimonies of individuals who claim they saw Henry Slade, the nineteenth-century medium, cheating. But he also accepts the testimonies of Zoellner and others of the genuineness of Slade's effects at other times.

Out of the sincere attempt to give credence to witnesses on both sides, certain scholarly proponents of the reality of paranormal phenomena have developed a belief system that not only handles these seemingly conflicting testimonies but insulates their beliefs from any possible falsification. I think it is important to fully understand this belief system and how it works. It is built up of basic cognitive principles that most of us, in our daily lives, probably employ to protect our cherished beliefs from erosion by the inroads of reality.

What follows is a tentative and incomplete attempt to make explicit the propositions and presuppositions that underlie the sincere and scholarly attempts to justify the paranormal. I hope to achieve a better and more complete characterization of this thought pattern at a later time. What I am presenting here is merely an illustration of what can be extracted from the study of the entries in Shepard's encyclopedia. The system will be presented as a set of numbered propositions:

1. Some apparently supernatural events can be accounted for by natural causes, such as: (*a*) unconscious muscular acts, (*b*) perceptual illusions, (*c*) selective perception, (*d*) hallucinations, (*e*) selective memory, (*f*) dissociation, (*g*) unconscious deception, (*h*) coincidence, (*i*) deliberate fraud.

2. When such natural causes are duly taken into account, some phenomena still remain which are truly paranormal.

3. These paranormal phenomena may be due to (*a*) new forms of energy or radiation previously unknown to science, (*b*) nonphysical causes that are beyond the pale of science, (*c*) nonhuman intelligences, such as spirits of the dead or entities from another realm.

4. A sensitive who cheats may do so (*a*) only as a way to supplement erratic or failing powers, (*b*) because it is less costly in effort and health then to employ genuine powers, (*c*) as a way of teasing or poking fun at stupid or incompetent observers, (*d*) because of possession by, or the influence of, evil or mischievous spirits, (*e*) because of suggestions implicitly accepted from a skeptic, (*f*) as a way of anticipating a truly paranormal occurrence.

5. An observer who honestly believes he or she has witnessed cheating by the sensitive may be making wrong inferences. In Shepard, for example, we learn that the spirit photographer Hope was discredited as a fraud when it was discovered that some of the alleged spirits that appeared in his photographs were of living persons. But a current reinterpretation exonerates Hope in that it is assumed that portraits of living as well as dead persons can be achieved paranormally. Likewise, as reported in Shepard, when a materialized "spirit" was seized by an intrepid witness and found to be the medium in disguise, this was originally considered evidence of fraud. But revised theories of materialization now allow for such

occurrences to be perfectly genuine after all!

6. When a witness catches a sensitive in the act of cheating, this often is because (*a*) the witness secretly wanted the sensitive to cheat and indirectly induced the cheating; (*b*) the witness is incompetent and his laxity actually encouraged the sensitive to take the easy road of cheating rather than the difficult path of producing genuine phenomena. (This charge was not only brought out against the scientists who caught Palladino in trickery, but it was also leveled against me because I allowed Uri Geller to employ trickery when I was investigating him. The implication is that if I was a good investigator, Geller would have not had the opportunity to cheat and would have been forced to display his genuine powers.)

7. A magician or critic who demonstrates that he or she can simulate, through trickery, an apparently paranormal feat (*a*) may actually be a renegade psychic who is not employing trickery but merely claiming to be using trickery (such charges were leveled at one time or another in all sincerity against Davey, Houdini, Maskelyne, Randi, and, recently, against myself); (*b*) further emphasizes the reality of the original paranormal event, because one can simulate or counterfeit only that which is real; (*c*) cannot do so under the "same" conditions as those under which the alleged "real" phenomenon occurred (whatever these "same" conditions were, it turns out that the "psychic" also cannot duplicate his or her own feats under these "same" conditions).

8. Because of the nature of paranormal phenomena, strict scientific controls are often inappropriate and self-defeating.

9. Truly paranormal powers and strong tendencies to cheat often occur together within the same individuals. In the case of poltergeists, we are told that the adolescent around whom the phenomena originally occur eventually learns to imitate the genuine phenomena through trickery.

10. If a sensitive has not been detected in cheating over several demonstrations, then the phenomena must be genuine. Richet stated as a rule that a medium who cheats could get away with it for a maximum of two years at the most. •

Proceedings of the 1976 CUFOS Conference. Center for UFO Studies, 1609 Sherman Ave., Evanston, Illinois 60201. 320 pp. Paperback, $15.

Reviewed by Robert Sheaffer

"A secret UFO conference," charged the critics of the Center for UFO Studies, when word of this by-invitation-only symposium began to leak out. "The heads of the major UFO organizations were left out... How can I find out what goes on in there?" asked one writer in exasperation. The proceedings of the 1976 CUFOS Conference are secret no longer, and anyone who is willing to shell out $15 for a paperback book can now obtain a copy of the papers presented at that highly controversial meeting. What went on behind those closed doors?

A great deal of new material was presented. Unfortunately, not all of it is good. A "mixed bag" is the most generous description one can give of this uneven collection. A few papers are excellent. A few others should have been laughed out

---

Robert Sheaffer studied astronomy at Northwestern University and is a member of CSICP's UFO Subcommittee.

---

of the hall. Let's peek inside the "secret" conference.

Dr. Richard F. Haines, a specialist in physiological optics, presented a detailed analysis of the way the human eye perceives a very bright object. This is, of course, an extremely important subject for UFO investigators to be aware of, because in a great many UFO reports the witness attempts to describe a brilliant light. This paper is highly technical, but the level of complexity is entirely appropriate to the subject at hand.

UFO investigators will find a wealth of new material in Dr. Haines's paper, as well as some valuable investigative insights: "If [a witness] cannot remember the presence of any afterimage when the viewing conditions were likely to have produced one, caution should be exercised in making further interpretation of the witness sighting report."

Equally technical is the paper by Mario DeSario and Jeffrey Kretsch, students at Southern Illinois University in Carbondale, concerning the mobile UFO Study Van that they soon hope to have operational. A very impressive paper. Linear dispersions of diffraction grating optical systems, expressed in Angstroms/Millimeter. A detailed analysis of the mathematical principles of a magnetometer. The derivative with respect to time of the double integral of *B* cosine theta over *d*-radius *d*-phi. Impressive as can be. Too bad it's nothing but eyewash.

Is it really necessary to dazzle the audience with differential calculus just to tell them that you hope to detect a UFO's magnetic field? If anyone out there wants to know how a magnetometer works, he can look it up in the same engineering textbook in which these SIU students found it. The highly technical razzle-dazzle serves no purpose here. It's as out of place as it would be if, announcing that I plan to buy a tape deck for my car, I suddenly launched into a quantum-mechanics discussion of the electron interchanges in the semiconductor crystals inside its circuits. It would appear that many UFO enthusiasts somehow think that the difference between a scientific paper and an unscientific one is that the scientific paper is filled with equations, any equations, from beginning to end.

Piling all those equations, graphs, charts, and calculations into a truck, and some useful equipment as well, DeSario and Kretsch hope eventually to meet up with a UFO, and "catch" it electronically. Lots of luck, fellows.

Another paper on instrumented UFO research, this one not at all pretentious, was presented by Ray Stanford, director of Project Starlight International (PSI). Stanford gave a fine talk on his group's determined efforts to obtain *hard data* on UFOs—something that no one has yet succeeded in doing.

PSI operates a highly sophisticated *fixed* observing station for UFOs, complete with telescopes, lasers, TV monitors, cameras, computers, and a barrage of other electronic devices. They seem to have everything they could wish for ... except UFOs. They thought they had one once. PSI triumphantly published a photograph that appeared to show the trail of a zig-zagging object that suddenly made an extraordinary right-angle turn. CSICP UFO Subcommittee member James Oberg looked into the matter and discovered that you could take an identical photograph of an earth satellite, provided that you bumped the camera. Stanford sadly agreed.

If a booby prize were to be awarded for the worst paper of the conference, the honor would have to go to Don Worley, industrial pattern-maker and UFO celebrity, for his findings on "UFO-Related Anthropoids." These are giant, hairy metaphysical apes ("King Kong Juniors," he fondly calls them) that tend to show

themselves predominantly to people who frequently report UFOs. Worley's apes, which can appear in full daylight and are sometimes transparent, are said to return often to the location of prior sightings and seem to have a positively uncanny ability to avoid being photographed. These hairy monsters, which Worley cautions against confusing with Yeti, Bigfoot, or similar mundane creatures, are said to exhibit "psychic" and "paraphysical" characteristics (they can "dematerialize" as if by magic), and they have reportedly been linked with UFO sightings in no less than nineteen instances. Here is a sample of one of Worley's ape reports, quoted in its entirety:

> *Derry, Pennsylvania*: UFO link, Return
> A farm was haunted by giant ape-like creatures when UFOs were seen in the sky.

I certainly am glad that Dr. Hynek has founded a *scientific* UFO Center, because I was getting fed up with all those *unscientific* groups out there, the kind that keep feeding us unsubstantiated reports from unnamed repeaters, while tying them in with "haunted" places and hairy ape-monsters. If CUFOS is a *scientific UFO group*, I'd hate to see the papers presented at the meetings of the unscientific ones! The Center for UFO Studies, like all groups, must be judged by what it swallows. Having swallowed Worley's tales with no apparent difficulty, they're about ready for sightings of the Tooth Fairy.

Skimming briefly through a few other papers:

Dr. F. Winterberg, theoretical physicist, presented some interesting speculations on how it *might* be possible to accelerate a spacecraft to nearly the velocity of light using very little energy (instead of the impossibly large amounts dictated by the theory of relativity), *if* there exist such things as particles of *negative mass* and if it is possible to somehow interleave them with the atoms of ordinary matter. He admits to a few sticky problems, such as the fact that nobody has yet proved that particles of negative mass exist, that they seem incompatible with relativity, that we don't know whether they contradict other areas in physics, and that these particles (negatons?) would even have to permeate the bodies of UFO passengers.

Dr. Bruce Maccabee, physicist, and Mr. William Spaulding, director of Ground Saucer Watch (GSW), each presented papers on the famous McMinnville UFO photographs of 1950, arguing that the object appears to be at a considerable distance from the camera and hence is an authentic UFO. Dr. Maccabee bases his conclusions on painstaking photometric measurements of the original negatives. His readings might, however, be interpreted in two ways: the object is huge and distant, or it is small, nearby, and either translucent or illuminated by daylight fill-in flash (which implies that it is a hoax). It is impossible to say which.

Mr. Spaulding says that his computer analysis of the photos reveals edge irregularities on the object, which is interpreted to mean that it is large and distant. Unfortunately, it is not that simple, because a few nearby wires also show irregular edges, while a distant tree and hill show edges that are perfectly straight. Also, his discussion of the photographic effect called "veiling glare"—very prominent in these photos—is not at all correct. How does this error affect GSW's analysis? A great deal more work needs to be done on these photos.

Ms. Anne Druffel, social worker, tells of "cloud-cigar" UFOs, which are said to appear repeatedly over the Santa Catalina Channel in California, near a place called Los Angeles. Unfortunately, they seem to be observed only by local UFO

buffs, and although they hover in place for an hour or more, sometimes in broad daylight, nobody ever seems to photograph them. Alas.

Three French scientists present their explanation for UFO propulsion systems: magnetohydrodynamics. Sounds terrific! Since this paper is crammed with mathematics from start to finish, its scientific merit must be overwhelming. However, the technically proficient reader, upon penetrating the jargon, will discover that this is a highly novel, highly speculative *aircraft* design. It is of no use whatever for spaceships. We might just as well try to fly to Zeta Reticuli on the Concorde.

The most scientific paper of them all, because he uses far more equations than anyone else, is the one by physicist James McCampbell. His not-too-surprising thesis is that microwave radiation in gargantuan doses, if focused *precisely* on the filament of an automobile headlight, *might* cause the headlight to dim or go out (an effect sometimes attributed to UFOs). McCampbell backs up his idea with 16 pages of mathematics. This is an invaluable analysis that should be studied carefully by every headlight designer. It has nothing whatever to do with UFOs.

Just as significant as the papers presented at this conference are those that were left out. Exactly how were the participants selected? Plainly the *quality* of the research was not a significant factor, because several of the papers are abysmally bad. One fact, however, clearly stands out: *all of these authors more or less agree with Hynek's ideas about UFOs.* Papers that are generally skeptical about UFOs, or even those that shoot down faulty UFO cases, are *not* represented here. Is this a *scientific* attitude? How can an organization call itself "scientific" if it encourages low-quality research, such as the papers by Worley and Druffel, *yet pretends that the often excellent work of UFO skeptics doesn't even exist*? No one associated with the CSICP was felt to have done any research worth presenting. Can it be that CUFOS feels threatened by dangerous, unwelcome new ideas (the same accusation they often hurl at the scientific establishment)? It appears that, like the Church in the Middle Ages, the Center for UFO Studies values orthodoxy very highly. •

Where Is Noah's Ark? By Lloyd R. Bailey. Festival Books, Nashville, 1978. 128 pp. Paper, $1.95.

Reviewed by Robert A. Moore

Since 1970, at least eleven books, innumerable articles, and three films, one a box-office bestseller, have appeared discussing a mysterious object located in a remote section of Turkey and the efforts to locate it and study it. Quite a number of people have reported sighting the structure, several indistinct and unconvincing photographs of it have been published, and a few fragments of wood from the "landing site" have been recovered. It has spawned a new pseudoscience, "arkeol-

---

Robert A. Moore is a student of philosophy and a free-lance writer specializing in religious subjects. He lives in Phoenix.

---

ogy," and inspired nearly 40 organized expeditions since World War II to search for it. If all this sounds suspiciously like another modern fascination, the UFO controversy, it is—with one major difference: this object is emphatically *not* unidentified, but is most assuredly the biblical ark of Noah of Genesis 6:9. Like that other controversy, one has to search far and wide to find a sober and balanced survey of the facts. *Where is Noah's Ark?* offers such a view.

Lloyd Bailey examines each of the four main types of evidence proffered by ark searchers as proof of their claims: the ancient "witnesses," modern sightings, photographs, and wood samples. He shows, contrary to the assertions of the apologists, that at least eight other mountains have been claimed in the past as the final resting place of Noah's ship and that "Mt. Ararat" (correct name: Agri Dagi) is actually the latest arrival in the field, and the least likely. He examines the various photos, including the famous satellite pictures, and demonstrates that none of them are admissible as evidence. (Of course, diehard ark enthusiasts, like UFO buffs, believe that the U.S. government has "secret" photographs that clearly show the ark on the mountain.) In discussing the different sightings, he notes the contradictions and internal inconsistencies that make them little more than hearsay. Unfortunately, some of the alleged sightings are omitted, but these turn out to be less substantiated than the ones that are discussed.

One of the few mistakes I noticed is in this chapter on the sightings, and I think it deserves mentioning. On page 54 he discusses Georgie Hagopian, an elderly (now deceased) Armenian who recalled visiting the ark as a boy. Bailey says that Hagopian claims "to have spent hours inside the structure," whereas the chief accounts of his adventure, including excerpts from a taped interview, have him climbing atop the object and seeing a large, dark hole, too black to see inside, which frightened him. The difference is important, because Hagopian's tape has passed a Psychological Stress Evaluator test, leading ark searcher Rene Noorbergen to say that he "may very well be the only real eyewitness we have." Significantly, the old man described the ark as one solid petrified mass, without nails or joints, covered with moss. An artist's conception based on his description is so similar to an "unidentified object" photographed in 1966—since found to be a rock formation—that arkeologist Kelly Segraves has put them side by side and suggested their identicality. Thus it appears that the best-attested sighting is of an unusual geological phenomenon—not uncommon in a volcanic area such as this.

Bailey's best chapter, previously appearing in *Biblical Archeologist*, is on the wood samples brought down by Fernand Navarra in 1955 and by a Navarra-led expedition in 1969. He examines the various techniques used to date the wood to the remote past and finds them wholly unreliable; on the other hand, several radiocarbon tests have an "amazing agreement" in dating the wood to the eighth century. Based on this date, Bailey tentatively espouses the theory mentioned by others that the "ark" may be a shrine built by pious medieval Armenians to commemorate the legendary landing of Noah at that place. Other religious buildings and relics further down the mountain help confirm this view.

In my opinion, this shrine theory is not only adequate to account for all the facts but is more than adequate. Bailey is often too kind to the ark fanatics and is reluctant to mention the possibility of pious fraud. But consider: several people, including two of his climbing companions, have accused Navarra of planting the wood on the glacier so he could "discover" it later; one ark photo is a clumsily retouched job, another turned out to be an April Fool's joke; the famous 1917 Russian expedition, whose 100-plus members are still faithfully tallied in the total

of people who've seen the ark, is pure fiction; a "secret" National Geographic-Smithsonian expedition barely missed fame when the informant refused a lie-detector test; and so on and on. If one dismisses Navarra's "finds," all other wood discovered on the icecap is easily attributed to the remains of monuments of previous mountaineers. The one passably acceptable sighting (Hagopian's) seems to be a rock formation. Add to these the cases of known or suspected fraud, the superstitions of the natives, the 38 postwar expeditions—some of which have explored the mountain thoroughly under ideal conditions—all of which have drawn a blank, and the infinite credulity of American fundamentalists, and the "mystery" dissolves right before one's eyes.

Whichever view we take, we certainly do not need to fall back on an ancient Babylonian legend about a worldwide deluge to explain the enigma of Mt. Ararat. Nor have we the solid proof that "atheistic evolution" is wrong and biblical creationism is true, which the ark is supposed to offer.

Bailey's book is little more than a hundred pages long and can be easily finished in an evening. Yet, aside from a few magazine articles, this is the first reliable reading in the huge heap of verbiage on the subject. I consider it essential for anyone who wishes to know the facts about Noah's ark today. •

Philosophy and Parapsychology. Ed. by Jan Ludwig. Prometheus Books, Buffalo, N.Y., 1978. 454 pp. Cloth, $15.95.

Reviewed by Mario Bunge

This is a collection of essays, most of them reprinted, on some of the methodological, epistemological, and ontological problems raised by parapsychology. Of the 23 authors, 19 are believers, 3 unbelievers (George R. Price, Richard Robinson, and Percy W. Bridgman), and one (Antony Flew) a skeptic. Two (Bridgman and Price) are scientists, and another two (C. D. Broad and Michael Scriven) are philosophers of science. None is an experimental psychologist and none an exact philosopher, i.e., one using mathematical tools of analysis. (The editor himself and most of the philosophers he has selected are ordinary language philosophers.) This skewness in the distribution of authors does not suggest that the selection itself has been biased but, rather, that most scientists and philosophers of science are either indifferent to parapsychology or loathe getting embroiled in polemics about it. Still, the volume may impress the naive reader because, on the whole, it recommends parapsychology as a serious field of research and its philosophy as being on the same footing as the philosophy of physics—as the editor himself suggests.

Mario Bunge is a professor of philosophy and head of the Foundations & Philosophy of Science Unit, McGill University, Montreal.

The best pieces are probably those of Broad, "The Revelance of Psychical Research to Philosophy" (1949), and Scriven, "New Frontiers of the Brain" (1961), pro-parapsychology, and "Is Psychical Research Relevant to Philosophy?" (Robinson, 1950) and "Science and the Supernatural" (Price, 1955) on the critical side. All four essays are clear, to the point, and outspoken. The one that impressed me most when I read it, three decades ago, was Broad's. Dull and superficial when writing on science, Broad waxed enthusiastic when dealing with the paranormal. In this particular paper he examined carefully the important and difficult problem that J. B. Rhine has touched on only lightly and most philosophers have disregarded, namely, the question of the extent to which parapsychology is compatible with the "basic limiting principles" (or ontological and epistemological presuppositions) of contemporary science. It is worth our while to listen to Broad on this point.

Broad selected four "basic limiting principles." First he examines the causal principle, or rather, the principle of antecedence, according to which no effect can occur before its cause(s). Clearly, this principle is violated by precognition. Another such principle is that mind cannot act directly on matter. (If it could, the experimenter would be unable to trust the readings of his meters.) This principle collides with PK. A third principle is the dependence of mind on body, or the impossibility of disembodied minds or souls. (If this were not so, physiological psychology would be hopeless. Moreover the souls of the departed would still be meddling in our affairs.) The fourth principle examined by Broad in this paper concerns the ways of acquiring knowledge, namely, with the help of sense organs. Telepathy and precognition would refute this principle. Broad recognized that parapsychology is inconsistent with those "basic limiting principles" (although he tried to minimize the discordance). A scientist would, of course, see in this incompatibility a sufficient reason for discarding parapsychology. Not so Broad: being a believer in the various kinds of paranormal cognition, he concluded that the latter "call for very radical changes in a number of our basic limiting principles" (p. 59). Rhine has never hesitated: since we have to choose between parapsychology and the system of ontological and epistemological principles inherent in contemporary science, he opts for the former.

Most of the other authors in this anthology are not worried about the world-view compatibility criterion for choosing among competing hypotheses and theories. They insist, rather, on "the evidence" (which they seldom question), unaware that brute (uninterpreted) empirical facts constitute no evidence; for every such fact has to be "read" in terms of some hypothesis, and every hypothesis is judged not only by its empirical performance (e.g., in predicting) but also by the way it jibes with accepted scientific theories. There is no discussion of these matters in this volume, and yet they are crucial to the evaluation of parapsychology, psychoanalysis, astrology, and the like.

The trouble with parapsychology is not the dearth of data but, rather, the total lack of hypotheses compatible with science. Practically all that parapsychologists tell us is that such and such (alleged) data are anomalous, i.e., unexplained by science. They suggest no mechanisms, they propose no theories (let alone mathematical ones), hence they are unable to supply any explanations. Compare this conceptual indigence with science. If an astronomer were to announce that a certain celestial object does not seem to "obey" the laws of celestial mechanics, he would feel it his duty to offer positive conjectures—e.g., that it is not a body but a laser beam, or some other physical thing, perhaps of unknown nature and obeying

some yet to be discovered physical laws. On the other hand, parapsychology, although at least 5,000 years old, has failed to produce a single law and is therefore far worse off than even the most superficial branch of "normal" psychology. (Have you ever heard of the First Law of Telepathy, or the Second Law of Psychokinesis, or the Third Law of Precognition? And have you ever seen a Mathematical Theory of Spooks capable of making definite and testable predictions?)

Parapsychology collects data and labels them but does not attempt to discover any laws, let alone to synthesize them into theories. But this is what scientific research is all about, namely, the search for laws and their use to calculate forecasts. Since parapsychologists do not do this kind of thing they do not qualify as scientists. Moreover, by defining the phenomena they are interested in as paranormal or unlawful, they equate them with miracles, i.e., events which either obey no laws or must remain forever beyond our understanding. Unfortunately, the philosophers anthologized in this volume skirt these problems: they do not even discuss the very crucial notion of a natural law or the key concept of a law statement (or corroborated generalization belonging to a hypothetical-deductive system). Instead, they are interested in proselytizing or in discussing purely verbal matters, such as whether the term *paranormal* is suitable. No wonder, for they are linguistic philosophers, and linguistic philosophy (or ordinary language philosophy), which originated with the second Wittgenstein, is notoriously uninterested in science and mathematics: it prefers parapsychology and psychoanalysis. But then why the title of this volume?

In conclusion, the book under review contains a few interesting papers, mostly well known, such as George Price's shattering article of 1955 and the replies it elicited. The volume reads as if it has been published twenty years ago. (Half of the authors have either died or retired or are about to retire. So, reading the book is really an exercise in communicating with the dead or dying.) But this is understandable, for religions do not advance: at best they suffer from attrition. In particular, as Scriven (a believer) pointed out nearly two decades ago, parapsychology has been suffering from "evaporation" (phenomena shown to be the product of error or of fraud) and "absorption" by science, as in the cases of hypnosis and hallucination. (One case of possible evaporation not mentioned in this book is that of Sir Cyril Burt, whose work on the inheritability of intelligence has recently been shown to be fraudulent.) All the same, despite its scientific staleness and philosophical shabbiness, this volume is worth having, for it collects conveniently a number of egregious errors and a few (far too few) exposures of them. •

Basic Annotated Bibliography

With this issue, we present the first section of a basic annotated bibliography of books critical of occult beliefs. It is a selected list and so necessarily leaves out some books that might have been included. Covering a span of years from the mid-nineteenth century to the mid-1970s, the bibliography was prepared for the SKEPTICAL INQUIRER by Robert R. Lockard of the University of Oregon Library, with the assistance of Ray Hyman, professor of psychology at the University of Oregon. Subsequent sections of this list will appear in future issues.

Abbott, David Phelps. *Behind the Scenes with the Mediums.* Chicago: Open Court, 1907. A handbook on the methods used by mediums, mostly for billet reading.

_____. *Fraudulent Spiritualism Unveiled.* In Julian Hawthorne, ed., *Library of the World's Best Mystery and Detective Stories.* New York: Review of Reviews Co., 1908.

Adler, Irving. *Monkey Business: Hoaxes in the Name of Science.* New York: John Day, 1957. Popular account of some of the most famous hoaxes: Piltdown man, Anton Mesmer, trisected angles, and a few others.

Anonymous. *Revelations of a Spirit Medium.* London: Kegan Paul, 1922.

Barber, Theodore Xenophon. *LSD, Marihuana, Yoga, and Hypnosis.* Chicago: Aldine, 1970. Scientific treatise, supported by National Institute of Mental Health grants, on the psychological and physiological effects of yoga, hypnosis, and psychedelic drugs. Reports recent research, with the focus on observable behavior rather than unobservable internal states. The author attempts to illustrate a method of analysis in the "soft" areas of psychology, which will allow the reader to think more critically and accept fewer assumptions.

Barnum, Phineas Taylor. *The Humbugs of the World.* Detroit: Singing Tree Press, 1970. (Reprint of the G. W. Carleton 1865 ed.) A good debunking book written by the master showman more than a hundred years ago. Although his canvass is broad (almost every conceivable area of "humbug" is covered) and it was written long ago, much of it is instructive today.

Brackman, Jacob. *The Put-On: Modern Fooling and Modern Mistrust.* Chicago: Regnery, 1971. Breezy exploration of a modern social phenomenon, the put-on: how it works, what's behind it, and what it might mean about contemporary sensibility. Trickery in public events, art, literature, fashion, music, and advertising is examined from a sociological perspective.

Bringle, Mary. *Jeane Dixon: Prophet or Fraud?* New York: Tower, 1970. *Publisher's Weekly* (198 [Nov. 2, 1970]: 54) says this is a hatchet job on a sitting duck.

Campbell, John L., and Hall, Trevor H. *Strange Things.* London: Routledge & Kegan Paul, 1968. A detailed debunking of a turn-of-the-century Scottish hoaxer. Subtitle: "The story of Fr. Allan McDonald, Ada Goodrich Freer, and the Society for Psychical Research's enquiry into Highland second sight."

Cantril, Hadley. *The Invasion from Mars: A Study in the Psychology of Panic, with the Complete Script of the Famous Orson Welles Broadcast.* Princeton, N.J.: Princeton University Press, 1940. A good case history and psychological study of how people in 1938 could easily be convinced that the earth was being invaded by creatures from Mars.

Carpenter, William Benjamin. *Mesmerism, Spiritualism, & Co. Historically and Scientifically Considered* (two lectures delivered at the London Institution, with preface and appendix). New York: Appleton, 1877; London: Longmans, Green, 1877.

Carrington, Hereward. *The Physical Phenomena of Spiritualism, Fraudulent and Genuine.* Boston: Turner, 1907; 3rd ed. New York: Dodd, Mead, 1920. Subtitle: "Being a brief account of the most important historical phenomena, a criticism of their evidential value, and a complete exposition of the methods employed in fraudulently reproducing the same." Although the author believes psychic phenomena do occasionally occur, he wants to demonstrate that many claims are fraudulent.

Chevreul, Michel Eugène. *De la Baquette Divinatoire, du Pendule dit Explorateur et des Tables Tournantes, au Point de Vue de L'histoire de la Critique et de la Méthode Expérimentale.* Paris: Mallet-Bachelier, 1954. A classic—one of the first scientific attempts to explain the pendulum, divining rod, and tilting table in terms of subconscious psychology.

Christopher, Milbourne. *ESP, Seers, and Psychics.* New York: Crowell, 1970. The author is a past president of the Society of American Magicians and currently chairman of the Occult Investigation Committee. As indicated by the title, this is a general treatment of many subjects. Each chapter is short and written in a breezy style. Criticism is brief and ironic, with no sustained criticism of the various claims.

_____. *Mediums, Mystics, and the Occult.* New York: Crowell, 1975. This book picks up where the previous book ended. Many current occult personalities are covered, including Uri Geller, Arthur Ford, Ted Serios, and Peter Hurkos, each handled with an eye toward the possibilities of deception.

Cohen, Daniel. *Myths of the Space Age.* New York: Dodd, Mead, 1967. Extensive but superficial survey of contemporary fringe beliefs, covering such subjects as astrology, ESP, Velikovsky, UFOs, the Loch Ness monster, prophets and psychics, Atlantis, and the sasquatch.

_____. *Masters of the Occult.* New York: Dodd, Mead, 1971. Each short chapter covers a famous occultist, usually a cult leader, written from a skeptical point-of-view: Madame Blavatsky, L. Ron Hubbard, D. D. Home, Eileen Garrett, Mesmer, et al.

_____. *Voodoo, Devils, and the New Invisible World.* New York: Dodd, Mead, 1972. A survey of the dark side of the current occult revival: the beliefs that we are all threatened by forces beyond our control. The author says that this

is not a "debunking" book because "the task is usually hopeless." Although it is a critical survey, it is mostly descriptive.

_____. *The Magic Art of Foreseeing the Future.* New York: Dodd, Mead, 1973. A short history of the various traditional modes of divination. Mostly straight description, but tinged with skepticism.

Cole, Sonia. *Counterfeit.* London: John Murray, 1955. "First it is necessary to review in general terms the main types of forgeries, a brief history of their manifestations, their penalties and implications. Next comes a study of forgers themselves, their psychology and motives, illustrated by widely drawn examples. The particular stories which follow, from archaeological, artistic and literary fields, are in fact detective stories with the merit of being true." (Chapter 1, page 1.)

Condon, Edward U. *Final Report of the Scientific Study of Unidentified Flying Objects.* New York: Dutton, 1969. The research for this report was conducted by the University of Colorado under contract to the United States Air Force. The report is a model of how reason and science can shed light on anomalous experience. Section 6, "The Scientific Context," is especially useful for the methodological problems. It considers, among other problems, the perceptual, psychological, and sociological aspects of individual sightings. The key conclusion: "On the basis of present knowledge the least likely explanation of UFO's is the hypothesis of extraterrestrial visitations by intelligent beings."

Cooper, Paulette. *The Scandal of Scientology.* New York: Tower, 1971.

Coover, John Edgar. *Experiments in Psychical Research.* Palo Alto, Calif.: Stanford University Press, 1917. A detailed report of early research done at Stanford University on psychical phenomena. Most of it is critical. These early experiments did not find much evidence for ESP.

Davies, John D. *Phrenology: Fad and Science; a 19th-Century American Crusade.* New Haven, Conn.: Yale University Press, 1955. A scholarly study, partly "a chronological narrative of the rise and spread of phrenology in America" and partly a "topical analysis of the impact of phrenology on various categories of social thought."

de Camp, Lyon Sprague. *Lost Continents: The Atlantis Theme in History, Science, and Literature.* New York: Gnome Press, 1954. (Published by Ballantine Books in 1975 with the title *Lost Continents: The Atlantis Theme.*) One of the best of the debunking books—not that it proves there are no "lost continents," but it does take up each theory and, after exhaustive, erudite examination, demonstrates its weakness.

de Camp, Lyon Sprague, and de Camp, Catherine C. *Spirits, Stars and Spells: The Profits and Perils of Magic.* New York: Canaveral Press, 1966.

De Giustino, David. *Conquest of Mind: Phrenology and Victorian Social Thought.* Totowa, N.J.: Rowman, 1975; London: Croom Helm, 1975.

Deutsch, Ronald M. *The New Nuts Among the Berries: How Nutrition Nonsense Captured America.* Palo Alto, Calif.: Bull Publishing Co., 1977. A history of food faddism in America written with wit. Debunks such books as *Calories Don't Count* and *Folk Medicine.*

Dingwall, Eric John, and Hall, Trevor H. *Four Modern Ghosts.* London: Duckworth, 1958.

Dingwall, Eric John, Goldney, Kathleen M., and Hall, Trevor H. *The Haunting of Borley Rectory.* London: Duckworth, 1956.

Dingwall, Eric John, and Langdon-Davies, John. *The Unknown, Is It Nearer?* New York: New American Library, 1956; London, Cassell, 1956. One of the many books that offer critical comments on the claims of the paranormal but still find something positive in all of it.

Dunninger, Joseph. *Inside the Medium's Cabinet.* New York: Davis Kemp, 1935. Detailed exposure of several fraudulent, celebrated mediums, as well as photographs and diagrams that debunk their more spectacular tricks.

Edmunds, Simeon. *Spiritualism: A Critical Study.* London: Aquarian Press, 1966. A balanced study, critical of the obvious frauds but willing to give evidence for the supernatural in a pro and con format.

Eisler, R. *The Royal Art of Astrology.* London: Herbert Joseph, 1946. The history of astrology, written from an opposing point-of-view.

Evans, Bergen, *The Natural History of Nonsense.* New York: Knopf, 1946. Exposition of popular fallacies about animals, death, childbirth, race, and other diverse subjects, written with a sense of humor.

_____. *The Spoor of Spooks, and Other Nonsense.* New York: Knopf, 1954. Witty but somewhat rambling discussion of fallacies regarding such varied subjects as youth and age, ghosts, sex, food, drugs, poison, and ESP.

Evans, Christopher. *Cults of Unreason.* New York: Farrar, Straus, 1973. An examination of a few of what the author calls "surrogate belief-systems," principally UFO cults, mysterious gadgetry, a few Eastern religious beliefs, and Scientology. The latter receives the most attention, and Evans gives one of the best accounts of it.

Fair, Charles. *The New Nonsense: The End of the Rational Consensus.* New York: Simon and Schuster, 1974. One of the more interesting and serious of the new crop of critical works. Only one of the three parts of the book is devoted to debunking such phenomena as ESP, UFOs, and Velikovsky. The other two parts are "about nonsense as a way of life, as therapy, and as a mother of institutions.... It is important to know why we should doubt Dr. Velikovsky's ideas, but more important to understand why millions of supposedly educated people have not done so."

Festinger, Leon, Riecken, Henry W., and Schachter, Stanley. *When Prophecy Fails.* Minneapolis: University of Minnesota Press, 1956. Deals with the behavior of individuals within a movement that made specific and unfulfilled prophecies, namely that the earth would shortly be destroyed but that followers would be picked up by extraterrestrial creatures and transported to another planet. A classic in social psychology.

Flew, Antony G. N. *A New Approach to Psychical Research.* London: Watts, 1953. A British philosopher provides a linguistic analysis of the claims of psychical research. The approach is skeptical, as befits a good philosopher, with extensive attention paid to language as the tool with which psychic phenomena are described and explained. Of special interest are the two case studies in the appendices: "...the first, on *An Adventure*, shows how the facts about what may or may not have been some kind of paranormal experience have been irrecoverably concealed by the subsequent actions of the two vital witnesses; the second, on *An Experiment With Time*, shows how an impressive structure of pretentious and misguided theory came to be erected on unsound foundations."

Flournoy, T. *From India to the Planet Mars.* New York: Harper & Row, 1900. A detailed study of a certain Helen Smith (pseudonym), who lived in Switzer-

land at the turn of the century and took on the personalities of various individuals, such as a Martian, a Hindu, etc. The treatment is careful and skeptical. Most of the explanation is by reference to natural laws, even though there is a residue the author says he cannot explain. A translation from the French edition of 1894.

Fornell, Earl Wesley. *The Unhappy Medium: Spiritualism and the Life of Margaret Fox*. Austin: University of Texas Press, 1964. A historical account of Margaret Fox put into a social and cultural context. The Fox case is used as an example to represent the larger story of spiritualism in America during the last half of the nineteenth century.

Freedland, Nat. *The Occult Explosion*. New York: Berkeley Publishing Co., 1972. This book is not critical of the occult; in fact, it is a breezy, journalistic account. The reason for its inclusion is the fact that it covers so much ground and, hence, is useful as an introductory survey.

Friedman, William F., and Friedman, Elizabeth S. *The Shakespearean Ciphers Examined; an Analysis of Cryptographic Systems Used as Evidence That Some Author Other Than William Shakespeare Wrote the Plays Commonly Attributed to Him*. London: Cambridge University Press, 1957. An excellent example of two competent scholars taking the time and trouble to examine the evidence for the claims of a fringe group. "They are entitled to a courteous and—whenever possible—a scientific examination of their arguments."

Fuller, U. *Confessions of a Psychic*. Teaneck, N.J.: Karl Fulves, 1975. Available from K. Fulves, Box 433, Teaneck, N.J. 07666 for $3.00.

Gaines, S. S. *Marjoe: The Life of Marjoe Gortner*. New York: Harper & Row, 1973. The story of the child evangelist from three-year-old precocity through adolescent awkwardness to his final break with the tent-evangelist life-style at twenty-three. Not particularly well written but does portray the stage management and showmanship of today's revival circuit.

Gardner, Martin. *Fads and Fallacies in the Name of Science*. New York: Dover, 1957. Examination of the more eccentric contemporary cults that have masqueraded as science. Gardner discusses, in an even-tempered and informed manner, such topics as the hollow-earth fanatics, Hörbiger, Bellamy and the theory of multiple moons, dowsing, naturopathy, iridiagnosis, Wilhelm Reich and orgone sex energy, L. Ron Hubbard and Scientology, Bridey Murphy, and food fads. A thorough and unique study in human gullibility.

Gauld, Alan. *The Founders of Psychical Research*. London: Schocken, 1968. A historical study of the backgrounds and motivations of three of the early researchers of psychic phenomena, Henry Sidgwick, Edmund Gurney, and Frederick Myers. All were prominent in the Society for Psychical Research. Although Gauld considers the possibility of fraud and self-deception, he believes that after this has been accounted for there is still something left that cannot be explained. Included here because of its balanced and scholarly treatment.

Gauquelin, Michel. *The Scientific Basis of Astrology: Myth or Reality*. New York: Stein & Day, 1970 (c1966). Bibliography. A comprehensive examination of the pseudoscience of astrology, covering its history as well as its principles. The author views it as an ancient and powerful means by which man first conceptualized the world and his place in it, but asserts that it has outlived its usefulness and is today only a caricature of what it once was. One

chapter summarizes the traditional arguments against astrology. However, Gauquelin presents the possibility of a new and vital kind of astrology—"astrobiology"—for our time, in which science replaces magic but continues to reveal the extent to which our bodies and our thoughts are connected with the universe by invisible threads.

Gibson, Walter Brown. *Secrets of Magic, Ancient and Modern*. New York: Grosset & Dunlap, 1967. Detailed explanations, with diagrams, of how classic magic tricks are done. Includes a section on the tricks of fake mediums.

Gibson, Walter Brown, and Young, Morris N. (eds.). *Houdini on Magic*. New York: Dover, 1953. Relevant are the sections "Houdini on Spooks," "Houdini on Miscellaneous Mysteries," and "Houdini on the Right Way to Do Wrong."

Godwin, John. *Occult America*. New York: Doubleday, 1972. The author, a newspaperman, sets out to describe and explain the current increase in occultism in America. It does not claim to be either a debunking or a boosting book. Instead, he has set out to write "a dispassionate inquiry into the motivations and workings of America's occultism." A fair journalistic account that compares favorably with Nat Freedland's book but does not cover as much territory.

Graubard, Mark. *Astrology and Alchemy, Two Fossil Sciences*. New York: Philosophical Library, 1953. A straightforward history, for the student in the history of science, of these two "dead" sciences. "...Collates authoritative researches on many phases of these sciences, and cites easily accessible works for the sake of presenting a unifying interpretation ..." The two are presented in the social and cultural context of their time.

Gresham, W. L. *Monster Midway*. New York: Rinehart, 1948. A popular account of the world of the carnival. To the extent the carnival indulges in fraud and deception, this book is an exposé of it.

—*Robert Lockard*

From Our Readers

The letters column is a forum for views on matters raised in previous issues. Letters are welcome. Some may have to be condensed.

Evaluating ESP experiments

Paul Kurtz's paper evaluating parapsychology as a science (Winter 1978) is the most careful, knowledgeable, and well-reasoned thing I have read on the subject.

I would differ with Professor Kurtz on only one point: I am not personally willing to accept that Professor Rhine or any other ESP (or PK) investigator has ever achieved results that are "above chance" (meaning, of course, above reasonable likelihood of having occurred through chance). High scorers—those I would be willing to accept. You run enough tests, you sooner or later hit some very high scores. Even long runs of high scores by particular subjects—those, too, I would accept. For who has not seen or heard of some spectacular runs at the gaming tables?

But "above (or below) chance" is something else, again. I respectfully submit that it is not possible to so control ESP experiments as to give this term any meaning. More bluntly, I submit that the "significance figures" that emerge from this field of research tend to be completely fraudulent, though perhaps not intentionally so. Let me give an example of how this can come about.

Suppose an ESP researcher, I'll call him Jones, conducts three different binomial experiments, which need have in common only that they are each designed to turn up support for the same given hypothesis. Suppose he looks over the results of the experiments and discovers that for one of the three the results appear substantially more significant than for the other two. Finally, add the not too unlikely supposition that Jones files and forgets the two less interesting cases and reports on just the third one.

Obviously, something not quite on the level has transpired here. Jones has had three shots at the target while only acknowledging one. He has, of course, come up with a better score than he seems to deserve. But just the same, assuming that the one experiment can be shown to have been conducted rigorously and honestly, there's no way to challenge its findings. They're there, and that's that.

The malfeasance must show up somewhere, but where? The answer is that it shows up in the significance level that Jones will claim. Say that he claims $P = .03$. He probably believes this claim, for there seems to be a tendency to view the significance level as the result of an experiment rather than what it really is, a yardstick for judging that result. But the fact is, he hasn't achieved $P = .03$ at all. What he has achieved is $z = 2.17$. This is the heart of the matter. A "P" of .03 may normally go along with the given "z" value, but Jones has no right to claim it, for Jones has had options available to him that are not ordinarily contemplated in the computing of "P"

from "z." Jones has had the option of choosing from among three possible "z" values. He has even had the option of selecting other than the highest, if he so chose. (In fact, he probably would select the second highest if the first were a negative value.) Providing additional routes by which you can reach a given target inevitably increases the probability that you could hit that target through sheer chance. Since that latter probability is just what the significance figure is supposed to represent, its numerical value has to be adjusted accordingly.

It may seem strange that a discarded experiment could influence the significance level for a separate experiment not discarded. But it does, in much the same way that stolen ballots influence the validity of an election. It is a pity that the principle is not more widely appreciated. Anyway, in the present instance it's easy to show that Jones's "*P*" figure should be .0873, not the .03 he will claim. Unfortunately, the latter, false figure will remain in the literature for perpetuity, there to fool even the critics and skeptics.

But is it fair to thus suggest that picking and choosing among experimental outcomes actually goes on in the ESP field? Well, with there being no overall monitoring mechanism, it would be strange if it did not. And when one considers that there are multi-member, full-time teams, one concludes that there must be by now a tremendous accumulation of findings. You might say, those people have results to burn. Or to otherwise dispose of.

The worst part of it is that they don't seem to appreciate that there's anything wrong with the practice. They'll blatantly pick and choose even among the findings of what was planned as a single, integral experiment. Thus, we'll read, for instance, "Subject E performed above chance throughout most of the morning session, but this may have exhausted her psi, for after that it seemed to wane." Here, the offense is even worse, because the meaning of the term "above chance" is distorted in an even more obvious way. Elsewhere in such a report it may be disclosed that E's performance for the experiment as a whole was null.

In order to repair the evil of the situation, I am not here suggesting that a worker would have to report on every finding no matter how uninteresting. It wouldn't hurt him, though, to lump his accumulated data in summary form. Failing that, he could pick which wares to display through the use of randomizing methods. The one thing he must not do is to compare results and pick the best ones. But this will be a difficult idea to sell. As Professor Kurtz indicates, there seems to be little hope that parapsychology will ever be a science.

Warner Clements
Beverly Hills, Calif.

No "decline effect"

I told you a year or so ago when you began that the professorial approach to parapsychology won't work because the people pushing the subject are simple frauds. At that time, it sounded like an extreme statement.

By your system you have to keep treating proponents of the paranormal as if they were honest searchers after the truth.

Now, I notice in Paul Kurtz's article on parapsychology (Winter 1978) that he mentions in passing that "one of the problems with ESP is that parapsychologists have noted a 'decline' effect, namely, that even gifted subjects in time lose their alleged 'ESP' ability."

Good grief, Charley Brown! What is going on? The decline is simply the operation of the laws of chance as shown in the standard bell curve. There's no "decline," there's just the evening out of the operation. If a guy goes to the track three times and wins, then loses five out of the next seven, is he declining or is luck catching up with him? What is the matter with Kurtz that he did not make this point?

Rhine and the PPists not once—I repeat, not once—ever did anything other than segregate runs. Mencken noticed that back in the '30s, and he had

a good nose for catching a phony.

Mortimer T. Cohen
New York, N.Y.

Loaded UFO questionnaire

When I read Philip J. Klass's review of Peter Sturrock's book in your periodical (Fall/Winter 1977), I noticed that he had failed to remark how very "loaded" was Sturrock's questionnaire. Had I been an astronomer and deemed it worthwhile to answer that questionnaire, I should have checked as my opinion the statement that "the UFO problem certainly deserves scientific study."

I should have done so primarily in the anticipation that the study would produce precisely the kind of information now given in your News and Comment article (Winter 1978, pp. 7-9), comparing a positively identified object with the descriptions of it by persons who thought or said they saw one of the marvelous cosmonautical machines.

What my reply to Sturrock's questionnaire would not have shown was my opinion that the common notion that the "UFOs" are operated by hypothetical inhabitants of hypothetical planets has about the same degree of probability as it has solipsism.

The important question is the reliability of observations by presumably rational observers without preconceptions.

As we know from the various religions, persons who are emotionally disturbed by superstitions are prone to both hallucinations and to the remarkable kind of mendacity by which persons lie for the purpose of convincing others of the "truth" of their own emotionally induced beliefs about the supernatural. When one makes the further allowance for the human desire to make oneself important in the eyes of his fellows, and the desire to profit from human gullibility, one has an adequate explanation of the greater number of reported sightings, and it would be an utter waste of time to study them.

There is, however, a residue that is psychologically important, especially reports attributed to experienced aviators. To these may be added some reports by presumably reliable observers on the ground.

Perhaps the most important datum in this whole business is provided by the astronomer mentioned by Mr. Klass in his review, who, upon investigation, found "inaccuracies and inconsistencies" in his original observation of what he believed at the time to be an inexplicable phenomenon.

R. P. Oliver
Urbana, Ill.

Gallup UFO polls

I was quite interested to read Philip J. Klass's report on the Gallup UFO polls (SKEPTICAL INQUIRER, Winter 1978). Klass mentions that he wrote to Dr. Gallup pointing out the ambiguity of the survey question: "In your opinion, are UFOs something real or just people's imagination?" He suggested Gallup rephrase this question in future polls and regretted that he had not received a reply.

I also wrote to Gallup because of the rather imprecise wording of the questions, and I did get an answer. Unfortunately, at the time of my writing I was unaware of the fact that Gallup had released, in June 1978, another UFO survey. My letter was only in reference to the results of a similar survey of 1973. In it, my objection to the above-mentioned question was along similar lines to Mr. Klass's and I suggested substituting for it: "In your opinion, are UFOs spaceships manned or controlled by an extraterrestrial intelligent species or are they products of false perceptions or plain imagination?" I also recommended modifying the question "Do you think there are people somewhat like ourselves living on other

planets in the universe, or not?" to "Do you think there are intelligent beings and advanced civilizations on other planets in the universe?"

A reply from Karen E. Blair, assistant editor of the *Gallup Poll*, thanked me for my interest in the Gallup polls and said the institute had no plans to ask questions on UFOs in the near future. But she added, "We will certainly take your suggestions into consideration the next time we do ask such questions."

In my opinion, this promise should be kept in mind, just in case Gallup comes up with another opinion poll on UFOs with scientifically unsound and confusing questions.

At the same time, I suggest that CSICP analyze the Gallup questionnaire on UFOs and come up with an appropriate alternative.

Peter Schenkel
Quito, Ecuador

Facing reality about publishing

My sympathy goes to Dr. Taves, who laments his difficulty in getting his debunking book published. I understand his feelings, since I went through a similar experience. My wife and I wrote a book called *Spirits, Stars, & Spells*, which was finally published by a small publisher. Although the book got good reviews, its sales have not been spectacular; its small initial printing is still not sold out, although the book was published in 1966.

In trying to disillusion our fellow primates, we must bear certain facts in mind. To refuse to do so is as irrational as belief in astrology. One fact is that debunking cults is simply not a commercial proposition, because, when you debunk some particular doctrine, the believers, by and large, are outraged, while the unbelievers don't care and are not interested.

As for the responsibilities of the media, in a capitalist democracy a publishing company that does not "live by the balance sheet" is soon out of business. This applies more to trade-book publishing than elsewhere, because such publishing is at best a precarious, low-profit enterprise. A more authoritarian government might, in theory, of course, issue orders that the voice of reason be heard; but what usually happens under such a government is that, instead of scientific objectivity, the public is fed some official ideology—religious, economic, or political—the purpose of which is to maintain and enhance the wealth, power, and glory of the ruling group. Take your pick.

L. Sprague de Camp
Villanova, Pa.

A debunking publisher

This is in reply to Dr. Ernest Taves's lament that he could not find a publisher for a proposed book debunking the various types of pseudoscientific beliefs so prevalent in our society. There is one! The George F. Stickley Company, 210 West Washington Square, Philadelphia, PA 19106.

Mr. Stickley, for many years the medical editor of J. B. Lippincott, established his own company to specialize in quality medical and scientific books. Our Committee worked closely with him to produce a comprehensive exposé of quackery, which has sold very well and developed a mailing list of potential customers for other debunking books. Recently, he has affiliated with the Van Nostrand Reinhold branch of Litton Educational Corporation to provide for national and international distribution.

We urge anyone interested in writing critical books about pseudoscientific subjects to contact Mr. Stickley.

Stephen Barrett, M.D.
Chairman, Board of Directors
Lehigh Valley Committee
Against Health Fraud, Inc.
Allentown, Pa.

Countering pseudoanthropology

My compliments to you for publishing John R. Cole's article "Anthropology Beyond the Fringe: Ancient Inscriptions, Early Man, and Scientific Method" (Spring/Summer 1978). There is a need for scientifically oriented professional anthropologists to take popular "crack-pot" claims seriously enough to refute both them and their specious forms of reasoning, and John Cole meets this need with his article. His engaging writing style recommends his article for use in introductory anthropology courses. In fact, I have already used it in my own courses.

Keep up the good work! I am recommending that the university library subscribe to your journal.

Douglas E. Brintnall
Department of Sociology,
Anthropology and Social Work
University of Northern Iowa
Cedar Falls, Iowa

Neutralizing nonsense

I have just received my first copy of the SKEPTICAL INQUIRER; it appears to be a really great magazine.

Your committee is the best thing that has come along in a long time; it is just the thing that is needed to counteract some of the nonsense that seems to be rampant today.

For many years I have been an admirer of Isaac Asimov, Martin Gardner, James Randi, and Carl Sagan. I am happy to be associated with a group of individuals such as these.

Let's hope that the committee can keep up the good work; perhaps it can neutralize some of the damage caused by the modern-day snake-oil peddlers and help keep us from sliding further into another dark age.

Walter E. Runkel
Southfield, Mich.

Delusions and disorders

Dr. Posner's letter in the Winter 1978 issue in which he contends that paranormalists are in many cases not naive but actually mentally ill is in complete accord with the theories of other mental health practioners. The one characteristic neurotics and psychotics have in common is their tendency to symbolize their conflicts. The field of UFOlogy and paranormal psychology is a field rich in symbolism and one that is readily embraced by many who are mentally ill. Dr. Arthur Janov, of primal therapy fame, has written of how well pseudoscience fits into an already existent delusional system. He feels that "it is no accident that former acid-takers stay hooked on UFOs, out-of-body astral projection, bizarre Eastern philosophies, pyramid power, religious conversion, etc."

Unfortunately, all attempts to dissuade these individuals of their delusions by reason are bound to meet with failure, since the delusion is bounded inextricably with their mental disorder.

It would be interesting to read a study of correlations between those who believe in paranormal events and their degree of emotional adjustment written in the same vein as "Chariots of the Gullible," which appeared in your Winter 1978 issue.

John A. Speyrer
Opelousas, La.

Solving a mini-mystery

The more sensational claims by Erich von Däniken about ancient astronauts have been successfully refuted, but the smaller claims to which he devotes only a couple of sentences are still generally left unexplained. Since I find it just as satisfying to discover a well-documented scientific explanation for one of these mini-mysteries, I thought I would share one with you.

In *The Gold of the Gods*, von Däniken mentions that objects appar-

ently manufactured by a sophisticated technology were found in the excavation of an ancient town dating from approximately 6000 B.C. The archaeologist who discovered these objects, completely mystified, asks, "How, for example, did they polish a mirror of obsidian, a hard volcanic glass, without scratching it and how did they drill holes through stone beads (including obsidian), holes so small that no fine modern steel needle can penetrate?" (James Mellaart, *Catal Huyuk, A Neolithic Town in Anatolia*, 1967, p. 211)

Now polishing a mirror takes only time and patience, but what about the holes in the beads? Well, as it turns out, similar stone beads were found in graves of the Pueblo Indians of Arizona, whose general level of technology is similar to that observed at Catal Huyuk. And the manufacture of these American beads is no mystery at all, but was fully described many years ago by E. W. Haury ("Minute Beads from Prehistoric Pueblos," *American Anthropologist*, 33 [1931] 80-87). Haury duplicated the ancient bead-drilling technique as closely as possible, using the sharp, strong spine of a readily available cactus, tied to a stick rotated between the hands. After 15 minutes of work, using sand as the abrasive, Haury was able to produce a hole that would just barely allow the finest sewing needle (no. 10) to pass through.

Maybe the next person who writes a book explaining "ancient mysteries" can include this.

George Fergus
Schaumburg, Ill.

Early balloon flights

In the Fall 1978 SKEPTICAL INQUIRER Philip Morrison has discovered an apparent error in my previous article "Von Däniken's Golden Gods" (Fall/Winter 1977). My reference to "Bartolomeu de Gusmão, who made his first flight on August 8, 1709" was misleading (unintentionally), and I hereby retract it. However, the only real error is in the precise *date*, which was not the date of Gusmão's first *manned* flight, but rather the date of his successful experiment, in the presence of the king of Portugal, with a small balloon. According to Jim Woodman's book *Nazca: Journey to the Sun* (Pocket Books/Simon & Schuster, 1977), a source I have no reason to doubt, it is recorded in Vatican archives that Gusmão did indeed make a manned flight "to a height of 60 feet above Lisbon and traveled just over a kilometer" (p. 80), in October of that year. It is strange that even Morrison admits that Gusmão "might have made glides once or twice." Although I do admit to making a mistake concerning the relatively trivial matter of a specific date (an error of about two months), my main point remains the same; viz., that: "There is ... the little known fact [as valid as many other facts of generally accepted history] that even in modern times the Europeans were not the first to make manned balloon flights."

Ronald Story
Tucson, Arizona

Astrology tests

The research strategy for an empirical test of popular astrology, detailed in the Fall 1978 issue of the SKEPTICAL INQUIRER, has many potential merits. Among these merits would seem to be the simplicity of (*a*) the research design described, (*b*) the data analysis offered, and (*c*) the conclusions which might reasonably be said to follow therefrom. This article appears to belie the discouraging dictum which holds that good tests of paranormal hypotheses can never be simple while simple tests can never be good. The elegant research design reported is just the sort of thing for which informed criticism, technical guidance, and faith in the "experts" would seem nicely needless.

Alas, however, an expert knowledge of so-called "interviewer-experimenter" effects, and of statistical methods, can, and possible should,

change markedly the meanings ascribed to the data and analyses reported in that article. While the conclusions reached might in fact be generally correct, the data that would support them are not reported in the article as published. I write this letter then, prompted by a feeling of regret that some of those same scientific objections so frequently applicable to attempts to serve beliefs in paranormal hypotheses should also have been present in this attempt to serve skeptical beliefs.

In particular, there are at least two central problems with the published article, each of which seems to require technical consideration and discussion. The first problem is that no information is given for evaluating the potential influence of sampling biases and interviewer expectancy effects (and attendant interactions). We need details about the 300+ respondents who declined to participate. Why did they decline? Why did the interview have so very many questions so suggestively relevant to astrology? How was this interpreted to respondents? What were they told? What were they asked? Who commissioned the survey and why? Most important, how many interviewers were used? What were they told about the study? What did they believe about astrology? How representative of the sample as a whole were their particular subsamples and scores? Even when the null hypothesis is thought to be true, the answers to these questions can markedly change the correct interpretation of survey results. These are not trivial matters, nor need they require many words to discuss adequately—if, of course, no problems lie buried in their answers.

Second, the statistics used are incorrectly employed and incompletely reported. Strictly speaking, a goodness-of-fit test is not in fact what has been employed on these data. And it is inappropriate to employ the Chi-squared test data with expected cell frequencies below 2 or even 5. Observed cell frequencies are not given in the article and rounding uncertainties make it difficult to recover them precisely by multiplying percentages times column NS. Clearly however, the 88 degrees of freedom in Table 2, the 33 degrees of freedom in Table 3, and the 44 degrees of freedom in Table 4 are far too many in view of the large numbers of cells with expected cell frequencies below 5. Attempts to affirm the null hypothesis are never best if there be other alternatives. In this case it should be possible to find an index of association which reflects the power of the astrological sign to predict various dependent criteria. It would then be possible to set confidence limits on this index. If the conclusions already reached are to be trusted, we could then see that even the strongest reasonable degree of association is, for practical purposes, equivalent to no association. I cannot help but wonder if Persi Diaconis, for instance, was ever reassured by the statistical analyses that appeared in the published report.

J. Barnard Gilmore
Associate Professor
Department of Psychology
University of Toronto
Toronto, Canada

Ralph W. Bastedo responds:

The preceding criticisms are inept and frivolous. Many of them ignore relevant paragraphs in the article.

1. As I pointed out, the primary reason for choosing this dataset was that the 1,000 respondents had been asked their birthdate. And, as I also noted in the article (pp. 20-22), the survey data had been collected previously for reasons other than *my test of popular astrology.*

The "Berkeley Religious Consciousness Project," a committee of distinguished scholars of which I was not *a member, designed the lengthy questionnaire—itself entitled* Perspectives on American Life Today. *The project sought to gauge attitudes with respect to prayer, human suffering, mysticism, the purpose of life, belief in God, religious peak experiences, spiritualism, church attendance, afterlife, morality,*

paths to happiness, and religions ranging from Satanism to Scientology.

The sampling was done back in 1971—before my affiliation with Berkeley—under a grant from the Institute for Religion and Social Change. The nationally renowned Survey Research Center (SRC) of the University of California at Berkeley employed its professionally trained, mature adult interviewers in conducting the face-to-face interviews.

2. The large response rate achieved by the SRC is—without doubt— praiseworthy.

The fact that 75 percent of the 1,340 households contacted by the interviewers resulted in completed interviews is testimony to the thoroughness and professionalism of SRC's employees. It must be remembered that the sampling region included the cities of Oakland, San Francisco, and Berkeley—densely populated urban centers pervaded by the fears and suspicions that accompany rising crime. While some intended respondents were deterred by the large amount of time—nearly two hours—required for the interview, I know of no *instance in which astrology was a factor.*

3. Due to the aim of the questionnaire, only a negligible *number of the question items were suggestive of astrology. Of the 286 questions asked the pollee, 280—98 percent—made no mention whatsoever of astrology, horoscopes, or zodiac signs.*

A complete description of the questionnaire, and sample, by the way, has been published by Robert J. Wuthnow in The Consciousness Revolution *(Berkeley: University of California Press, 1976).*

4. To suggest that the chi-square has either been miscalculated or misapplied is absurd. The results of a variety of methods could *have been reported, but chi-square was cited (a) due to its appropriateness in testing the "generic" hypothesis and (b) because it is an old, familiar face to any student of introductory statistics. Yet because there are—contrary to the predictions of astrologers—so few cases in some extreme rows of Tables 2, 3, and 4, criticism is now directed to the quantitative analysis.*

To critics who suggest I should have collapsed each of the three tables into two rows and two columns so as to maximize cell size, I have only one answer: I did *just that. And this was reported in the article (see especially p. 35).*

For Table 2, this procedure produced a chi-square of 0.400 and a probability value of .53. For Table 3, this produced a chi-square of 0.006 and a probability value of .91. For Table 4, it produced a chi-square of 0.017 and a probability value of .89. All these results are statistically insignificant.

5. To those who prefer unnamed alternatives to chi-square, let me suggest Kendall's tau-b (τ_b), Kendall's tau-c (τ_c), gamma (γ), and Somers's D asymmetric d_{yx})

Collapsing Tables 2, 3, and 4 into doubly ordinal tables permits us to apply these ordinal measures of association. For Table 2, this procedure produced a tau-b of +.007, a tau-c of +.008, a gamma of +.010, and a Somers's D of +.008. For Table 3, this produced a tau-b of -.004, a tau-c of -.004, a gamma of -.009, and a Somers's D of -.004. For Table 4, it produced a tau-b of *+.015, a tau-c of +.016, a gamma of +.027, and a Somers's D of +.017. All the results, once again are statistically* insignificant. *Similar results can be shown for the other 30 dependent variables.*

6. Lastly, I am grateful that the editor permitted such comprehensive, detailed reporting of the data—something which few other journals allow.

To recap: Knowing a person's astrological sign would appear to tell you absolutely nothing about that person's characteristics. And even a slow-thinking Taurus *should be able to grasp this.*

Ralph W. Bastedo
Laboratory for Behavioral Research
SUNY at Stony Brook
Stony Brook, N.Y.

Catch Up On What You've Missed In The SKEPTICAL INQUIRER Order These Back Issues NOW

Partial Contents of Past Issues

WINTER 1978 (vol. 3, no. 2): Is Parapsychology a science? *by Paul Kurtz*, Chariots of the gullible *by W. S. Bainbridge*, The Tunguska event *by James Oberg*, Space travel in Bronze Age China *by David N. Keightley* ($5.00)

FALL 1978 (vol. 3, no. 1): An empirical test of astrology *by R. W. Bastedo*, Astronauts and UFOs *by James Oberg*, Sleight of tongue *by Ronald A. Schwartz*, The Sirius "mystery" *by Ian Ridpath* ($5.00)

SPRING/SUMMER 1978 (vol. 2, no. 2): Tests of three psychics *by James Randi*, Biorhythms *by W. S. Bainbridge*, Plant perception *by John M. Kmetz*, Anthropology beyond the fringe *by John Cole*, NASA and UFOs *by Philip J. Klass*, A second Einstein ESP letter *by Martin Gardner* ($7.50)

FALL/WINTER 1977 (vol. 2, no. 1): Von Daniken *by Ronald D. Story*, The Bermuda Triangle *by Larry Kusche*, Pseudoscience at Science Digest *by James E. Oberg and Robert Sheaffer*, Do fairies exist? *by Robert Sheaffer*, Einstein and ESP *by Martin Gardner*, N-Rays and UFOs *by Philip J. Klass*, Secrets of the psychics *by Dennis Rawlins* ($7.50)

SPRING/SUMMER 1977 (vol. 1, no. 2): Uri Geller *by David Marks and Richard Kammann*, Cold reading *by Ray Hyman*, Transcendental Meditation *by Eric Woodrum*, A statistical test of astrology *by John D. McGervey*, Cattle mutilations *by James R. Stewart* ($7.50)

FALL/WINTER 1976 (vol. 1, no. 1): Dianetics *by Roy Wallis*, Psychics and clairvoyance *by Gary Alan Fine*, "Objections to Astrology" *by Ron Westrum*, Astronomers and astrophysicists as critics of astrology *by Paul Kurtz and Lee Nisbet*, Biorhythms and sports performance *by A. James Fix*, Von Danien's chariots *by John T. Omohundro* ($7.50)

Please send me the following issues:

$5.00 each	Winter 1978	☐
	Fall 1978	☐
$7.50 each	Spring/Summer 1978	☐
	Fall/Winter 1977	☐
	Spring/Summer 1977	☐
	Fall/Winter 1976	☐

Total $_____

Bill me ☐

Check enclosed ☐

Name _____ (print clearly)

Street _____

City _____

State _____ Zip _____

The Skeptical Inquirer • Box 29 • Kensington Station • Buffalo, N.Y. 14215

Scientific Consultants

These scientists and scholars are consultants to the Committee for the Scientific Investigation of Claims of the Paranormal.

John R. Cole, research associate in anthropology, University of Massachusetts
J. Dath, professor of engineering, Ecole Royale Militaire, Brussels, Belgium
Sid Deutsch, professor of bioengineering, Rutgers Medical School
J. Dommanget, astronomer, Royale Observatory, Brussels, Belgium
Naham J. Duker, assistant professor of pathology, Temple University
Frederick A. Friedel, philosopher, Hamburg, West Germany
Robert E. Funk, anthropologist, New York State Museum & Science Service
Laurie Godfrey, anthropologist, University of Massachusetts
Donald Goldsmith, astronomer; president, Interstellar Media
Henry Gordon, magician, Montreal
Stephen Jay Gould, professor, Harvard University
Norman Guttman, professor of psychology, Duke University
Edwin C. Krupp, astronomer; director, Griffith Observatory
Richard H. Lange, M.D., chief of nuclear medicine, Ellis Hospital, Schenectady, New York
Gerald A. Larue, professor of biblical history and archaeology, University of Southern California
David Marks, professor of psychology, University of Otago, Dunedin, New Zealand
Joel A. Moscowitz, assistant clinical professor of child psychology, University of California, Los Angeles
William Nolen, M.D., Litchfield Clinic, Litchfield, Minnesota
Robert B. Painter, School of Medicine, University of California
John W. Patterson, professor of materials science and engineering, Iowa State University
James Pomerantz, assistant professor of psychology, State University of New York at Buffalo
Robert H. Romer, professor of physics, Amherst College
Milton A. Rothman, professor of physics, Trenton State College
Robert J. Samp, M.D., assistant professor of education and medicine, University of Wisconsin-Madison
Erwin M. Segal, professor of psychology, State University of New York at Buffalo
Elie A. Shneour, biochemist; president, Biosystems Assoc., Ltd., La Jolla California
Barry Singer, associate professor of psychology, California State University, Long Beach
Gordon Stein, medical education manager, Abbott Laboratories; editor *The American Rationalist*
Waclaw Szybalski, professor, McArdle Laboratory, University of Wisconsin-Madison
Ernest J. Taves, M.D., psychoanalyst, Cambridge, Massachusetts

The Committee for the Scientific Investigation of Claims of the Paranormal

The Committee for the Scientific Investigation of Claims of the Paranormal has the following objectives:

- *To establish a network of people interested in critically examining claims of the paranormal.
- *To prepare bibliographies of published materials that carefully examine such claims.
- *To encourage and commission research by objective and impartial inquirers in areas where it is needed.
- *To convene conferences and meetings.
- *To publish articles, monographs, and books that examine claims of the paranormal.
- *To not reject such claims on a priori grounds, antecedent to inquiry, but rather to examine them objectively and carefully.

THE SKEPTICAL INQUIRER (formerly THE ZETETIC) is the official journal of the Committee.

Paul Kurtz, Chairman; Philosopher, State University of New York at Buffalo.
Lee Nisbet, Executive Director; Philosopher, Medaille College.
Kendrick Frazier, Science Writer; Editor, THE SKEPTICAL INQUIRER.

Fellows of the Committee:

George Abell, Astronomer, UCLA; **James E. Alcock**, Psychologist, York Univ., Toronto; **Isaac Asimov**, Chemist, Author; **Irving Biederman**, Psychologist, SUNY at Buffalo; **Brand Blanshard**, Philosopher, Yale; **Bart J. Bok**, Astronomer, Steward Observatory; **Bette Chambers**, American Humanist Association; **Milbourne Christopher**, Magician, Author; **Daniel Cohen**, Author; **L. Sprague de Camp**, Author, Engineer; **Eric J. Dingwall**, Anthropologist, Author; **Christopher Evans**, Psychologist, National Physical Lab., U.K.; **Charles Fair**, Author; **Antony Flew**, Philosopher, Reading Univ., U.K.; **Yves Galifret**, Exec. Secretary, l'Union Rationaliste; **Martin Gardner**, Author, *Scientific American*; C. E. M. Hansel, Psychologist, Univ. of Wales; **Sidney Hook**, Prof. Emeritus of Philosophy, NYU; **Richard Hull**, Philosopher, SUNY at Buffalo; **Ray Hyman**, Psychologist, Univ. of Oregon; **Leon Jaroff**, Senior Editor, *Time*; **Lawrence Jerome**, Science Writer, Engineer; **Richard Kammann**, Psychologist, Univ. of Otago, Dunedin, New Zealand; **Philip J. Klass**, Science Writer, Engineer; **Marvin Kohl**, Philosopher, SUNY at Fredonia; **Lawrence Kusche**, Science Writer; **Ernest Nagel**, Prof. Emeritus of Philosophy, Columbia; **James E. Oberg**, Science Writer; **James Prescott**, Psychologist, HEW; **W. V. Quine**, Philosopher, Harvard Univ.; **James Randi**, Magician, Author; **Dennis Rawlins**, Science Writer, Astronomer; **Carl Sagan**, Astronomer, Cornell Univ.; **Evry Schatzman**, President, French Physics Association; **Robert Sheaffer**, Science Writer; **B. F. Skinner**, Psychologist, Harvard Univ.; **Marvin Zelen**, Statistician, Harvard Univ.; **Marvin Zimmerman**, Philosopher, SUNY at Buffalo.

Affiliations given for identification only.

Committee sections have been established in Canada, France, Belgium, Germany, Great Britain, and New Zealand. The Committee has UFO and Education subcommittees.